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THE ROLE OF PAPER PROFITS IN INDUSTRY

By GEORGE E. PUTNAM

THE term "paper profits" clearly implies the idea of realizable profits that have not yet been turned into cash—that is, profits existing only on paper. The term is used most consistently in this sense by investors and speculators when estimating the profits they would actually realize if they sold their securities at the current market price. Such estimates may serve as a guide to their selling operations. When the paper profit approaches the goal which the investor or speculator has set, or when it is endangered, he considers whether or not it should be converted into cash, that is, into a realized profit.

It is difficult for the manufacturer or merchandiser of a large volume of goods to apply the term in its literal sense to his own business. Unlike the investor who may know off-hand, or can easily determine, the cost of most of his securities, the head of a large business would hardly find it worth while to make laborious comparisons between the cost of all his products and their market value. A task of this kind would necessarily be burdensome, and the results would be practically valueless as a guide to business policy.

When the executive wants to know how his business is progressing, he calls for a profit and loss statement. No mention is made of paper profits in this statement, and, where the inventories have been valued at cost, he may feel justified in assuming that it contains no paper profit. For the most part he regards the earnings shown in his profit and loss account as a realized profit because he is constantly making sales and realizing a profit. If he speaks of his paper profits at all, it is only as some vague and incalculable part of his earnings which were easily gained as the result of buying and selling on a rising market.

During the war years, for example, when profits in industry were unusually large and when business men generally were accused of making unreasonable profits, the customary retort of manufacturing and trading companies to the

charge was that their profits were largely paper profits. This summary explanation was intended to be the last word on the subject. The notion it was meant to convey, and quite rightly, was that large profits had been made fortuitously through rising prices and not as the result of a deliberate attempt on the part of business to take toll from the public. Unfortunately, the real meaning and significance of the term to business policy was scarcely appreciated at all, and it is doubtful whether it is appreciated any more now than it was then.

In the writer's opinion, paper profits are, for all practical purposes, as definite and calculable a thing in industry and trade as they are in any other field, and the significant part they play in business management and in business cycles is a matter deserving of far more attention than has yet been given to it. In order that the principles underlying the whole problem may be put into a proper setting before applying them to industry, attention will first be given to the nature of paper profits where the investing classes are concerned.

Investors' Paper Profits

At the present time, the thousands of investors who make it a practice to buy securities primarily for the sake of the regular income they afford are deriving solid comfort out of the tremendous rise that has taken place in security prices during the past two years. Nearly all classes of investors have made large paper profits. Even the conservative bond buyer who invested $50,000 in railroad, public utility, and industrial bonds in January, 1924, now finds that he has a paper profit of $3,500 to $4,500. The stockholder, of course, has fared much better. Industrial stocks bought outright for $50,000 in May, 1924, can now be sold for more than $70,000. The general advance in the stock and bond market has greatly enhanced the value of the capital belonging to security owners, though their income in the form of dividends and interest is probably no larger than it was before.

It is easy to understand why investors should be happy in the knowledge that all has gone well with their investments. There is also good reason why they should be elated over the fact that they can sell their securities for 10%, 20%, or 40% more than they paid for them, especially if they made their investments with the aid of borrowed money. But where they have invested their own funds in stocks and bonds for the purpose of getting an income, and expect to go on deriving an income from that source, what good does a paper profit do them?

The intelligent investor knows, or will soon discover, that if he sells his securities in order to take his profits, and then reinvests in other equally good securities, he will gain nothing on the exchange unless he is able to reinvest his funds in securities which are selling for less than their investment worth. But it is not easy for the ordinary investor to find bargains of this kind when he wants them. The average security buyer who tries to make a profit by getting out of one group of investments and into another will usually find that other securities of the same grade have appreciated in value quite as much as his own, so that the only way he can convert his paper profits into profits that will immediately increase his interest and dividend income is by the substitution of inferior bonds and shares in which the element of risk is obviously greater. It should be pointed out, how-

ever, that a conversion of this kind, if profitable, could have been made just as profitably before security prices rose.

It is impossible for the average investor to derive any permanent gain from a general rise in security prices *if he stays in the market for income purposes*. His paper profits are ephemeral. The same may be said of any cash profit he realizes from the sale of securities if he reinvests the profit for income purposes. All such profits will be wiped out by paper losses when security prices fall. They contribute nothing to his income, nor, in the long run, to his ability to increase his expenditures. Naturally, he may be tempted by the magnitude of his paper profits to borrow money and buy this or that luxury which he has never before felt he could afford. But in yielding to a temptation of this kind he is only mortgaging his future income. Later on, he will be forced to reduce his expenditure by a corresponding amount in order to pay off the bank loan.

Where the investor who has bought outright with his own funds wishes to "cash in" his paper profits and increase his income, his safest course is to sell his securities, withdraw from the market, and wait for a fall in security prices. During the period of waiting he can keep his funds on deposit in a savings bank at interest; he can buy notes and acceptances having a maturity of three or six months; or he can buy bonds maturing in one, two, or three years, anticipating as best he can the time when long-term bonds and stocks will again become attractive investments.

It should be noted, however, that in resorting to such tactics, one cannot save all of the paper profit. The interest received on bank deposits, highly marketable acceptances, and short bond maturities is uniformly low, so that the investor will necessarily get a smaller income during the waiting period. Taking this factor into account, it will be seen that the investor does not profit by the full difference between the price at which he sells his securities and the price at which he buys them back. Even if he waits until security prices return to the level where he made his original purchase, and then "buys in" at that price, he has not saved all of his paper profits because his income was lower during the period of waiting.

Paper Profits in Industry

Turning to the question of paper profits in industry, it may be stated at the outset that the phenomenon of paper profits has been as comforting to the business executive as it is now to the investing classes, although the executive has not clearly recognized the phenomenon under that name. Having no clear-cut conception of the part which paper profit may play, he assumes, quite naturally, that his business is better off by the amount of "profits" shown in the profit and loss account; also that the extra profits which come from buying and selling on a rising market cannot be distinguished from any other form of profit.

For the business man's attitude on these points, the accounting authorities have been largely responsible. Having evolved a procedure that worked well so long as the level of prices remained fairly stable—namely, the procedure of taking inventories at cost, or at the market if lower than cost, so as to rule out unrealized inventory profits—they have been slow to devise a procedure that would serve its purpose equally well during a period of unstable price levels.

The truth of the matter is that a

danger lurks in every profit and loss statement when prices are rising or when the price level is already inflated. The profit and loss account makes no distinction between trading or manufacturing profits actually realized and paper profits growing out of the rise in inventory values. The two are commonly regarded as one and the same thing; in fact, according to the generally accepted rules for calculating profit, they are the same. Nothing would seem more logical than that the profits of a business over a year's time should be the sum remaining after adding together the year's sales and final inventory and deducting from this figure the original inventory plus all expenses, depreciation, and so forth. And yet, very serious consequences can come, and have come, from accepting the results of such a calculation as profit.

Suppose, to take the simplest case, that prices rise 10% so that a business which has a stock of goods on hand costing $1,000,000 will be able because of a corresponding rise in price to get 10% more from the sale of its goods than would otherwise have been the case. On the face of things, the rise in prices should increase the "profit" of the business by $100,000; and, after the goods have been sold, the $100,000 will appear in the profit and loss account along with other gains as "profit."

Of what use is this profit to the owners of the business? As a matter of fact, it is not a profit at all in the sense that the business is better off for having it. It cannot be used to pay dividends, to make extensions, or to increase inventories. It is an ephemeral paper profit which, though it may temporarily beautify the appearance of the books of record, must be, at least in large part, put back into higher-priced inventories to await the time when losses will be sustained as the result of falling prices. It is a reserve against falling prices and nothing more. The only way to convert it into a real profit is to sell the business to other interests, or to sell the inventories and "withdraw from the market." But withdrawing from the market after the manner of investors is not a common occurrence in business. The modern business firm has obligations to its customers and it has competitors to contend with. The business man must stick to his post as long as he can, whether prices are high or low.

The position of the business man is almost identical with that of the investor who buys securities for the immediate income they afford. It has previously been shown that an investor of this type can convert his paper profit into cash and then reinvest the cash profit in other income-bearing securities. But he is no better off for having the profit, whether on paper or in the form of cash. His income has not been increased in the slightest. In the same way, the business that converts its paper profits into cash is no better off as a result of this realized profit. It will immediately find that a greater amount of cash is required to replace the inventories, because after prices have risen the cost of replacement will also be greater. Paper profits are therefore needed to carry the same quantity of inventories and to afford protection against the time when inventory losses will be sustained as a result of falling prices.

Detecting and Calculating Paper Profits

The method to be followed in detecting and calculating paper profits in industry may be shown more clearly by referring to the operations of a firm which makes its purchases correspond

TABLE I. METHOD TO BE FOLLOWED IN DETECTING AND CALCULATING PAPER PROFITS IN INDUSTRY

Month	Inventory at the Beginning of the Month. 400,000 lbs. at Cost	Selling Price per lb. during the Month (cents)	Monthly Sales of 100,000 lbs.	Replacement Cost per lb. during the Month (cents)	Cash Profit to Be Withdrawn from the Business	Paper Profit to Be Retained in the Inventory
First	$40,000	11	$11,000	10½	$500	$ 500
Second	40,500	11½	11,500	11	500	1,000
Third	41,500	12	12,000	11½	500	1,500
Fourth	43,000	12½	12,500	12	500	2,000
Fifth	45,000	13	13,000	12½	500	2,000
Sixth	47,000	13½	13,500	13	500	2,000
Seventh	49,000	.....	.....	.....	.....	.....

Increase in the value of inventories	$ 9,000
Paper profit	9,000
Cash profit	3,000
"Profit"	12,000

exactly with its sales so that it always has an inventory of say 400,000 pounds of product. It has sales of 100,000 pounds of product a month, and its selling prices average 1 cent per pound over current cost. If the prices at which its products are bought and sold advance one-half cent per month, the results by months would be as shown in Table I.

Reference to the table shows that the paper profit corresponds exactly with the increase in the value of inventories where the quantity and quality of the inventory remain the same. In practice, the exact amount of paper profit may be concealed by reason of the fact that changes have taken place in the quantity or quality of the inventory since the end of the last accounting period. In terms of the table at the top of this page, for example, the firm might have borrowed money and increased its inventory to 500,000 pounds, say, in the sixth month, in which case the increase shown in inventory values at the beginning of the seventh month would overstate the paper profits. But a possibility of this kind in no way affects the calculation of the reserves required to make the profit and loss statement a truthful guide. Assuming that the accounting period is one of twelve months, the reserve that should be set aside as a protection against inventory losses will be the difference between the cost (or market value if lower than cost) of inventories at the end of the year and what the same quantity and quality of inventories would have cost at the beginning.

Where paper profits are recognized as such and earmarked as a reserve, the financial problem takes care of itself. There is no need to borrow new capital to finance higher-priced inventories because higher and higher prices are realized from the sale of the goods on hand. Moreover, the business that follows this course is reasonably prepared to suffer losses as the result of a decline in prices. In the above illustration, prices could fall 25% without impairing the original capital of $40,000.

Effect of Paper Profits on Price Levels

How many business executives are there who would take this view of their

"profits"? What usually happens is this: The head of the firm, unmindful of the danger that lurks in his profit and loss account, notes with satisfaction the large "profit" in his business. He has competitors who will steal a march on him if he is not careful; and, instinctively, he feels the call to action. Sooner or later he will be prompted by business instinct or by the tactics of competitors to do one or all of three things on the strength of phenomenal earnings, namely, pay out more in dividends, increase the fixed investment, or carry larger inventories.

It has already been shown that paper profits are needed for the replacement of inventories at enhanced prices; also that such profits can be realized in cash and withdrawn from the business only to the extent that the size of the inventory is permanently reduced. In order, therefore, to raise cash for dividends, fixed investment, or for the carrying of larger inventories, it is necessary to borrow money. The profit and loss account appears to justify this course, and, in the estimation of the banker, the working capital ratio justifies the granting of a bank loan.

Borrowing for any one of these three purposes on the strength of paper profits is sufficient to cause trouble. In spending money which has not been earned, the management has mortgaged the future earnings of the business. When prices fall, dividends must be suspended to take care of inventory losses and the repayment of bank loans. Moreover, the increase in bank borrowing for fixed investment purposes, followed by a decline in inventory values, is almost certain to produce an unfavorable working capital ratio, with the result that the banker will refuse to renew his loans. The only course now left to the business is to try to pay off its bank loans by selling short-term notes to the public. This can be accomplished if the owners still have a sufficient equity in the business. Even so, the business is now burdened with heavy interest and amortization charges and its competitive ability is weakened.

The situation would be worse still if money had been borrowed to carry larger inventories. This is one of the mistakes most commonly made during a period of rising prices. "Profits" already made, together with the "profits" in prospect, invite expansion on borrowed funds; inventories are increased, and the inventory turnover is allowed to slow down.

A reserve exactly equal to the paper profit would protect the original capital used in the inventories. But what protection would there be for the borrowed capital which was used to increase the inventories after prices had risen? Obviously, a fall in prices would seriously impair the borrowed capital even though a paper profit reserve was used to protect the original capital. These considerations add force to the suggestion already made that the reserves should be something more than the paper profit "earned" in the business—they should be large enough to include also the paper profit in the products purchased with borrowed capital if there is to be protection against losses due to declining inventory values.

One has only to recall the madness that prevailed during the inflation of 1918-1919, and the difficulties subsequently encountered to recognize the part which paper profits and cheap credit played in bringing general disorder into the business structure of the country. The experience which the business community had during these years is analogous to that of the investor who increased his expenditures

because he felt that the rise in the price of his securities had made him richer. It has previously been shown that the investor who stays in the market and spends his paper profits must suffer a corresponding reduction in his spending power in the future. In the same way, when the business community spent its paper profits during the 1918-1919 inflation, it spent something that did not belong to it. Later, it was required to make restitution by going through a period of business depression. In this thought lies the material for a new version of the theory of business cycles.

It is not the contention of the writer that the cause of business cycles is to be found in paper profits alone. There are, in fact, many contributing causes to the upward and downward trend of prices. It is to be observed also, when speaking of causes, that no matter how important a factor paper profits may be, there must be a force, or forces, which first of all produces them. The only point for which the writer contends is that among the many causes which combine to produce a marked rise in prices, paper profits are one of the most outstanding and aggravating factors. They make the rise in prices last longer because they lead to increased business activity on a reduced turnover of inventories, and, by the same token, they make the period of recovery more difficult.

Effects of Paper Profits

The effects of paper profits may be set forth in approximately their natural order. Starting with a period when interest, wages, and raw material prices are relatively low, when there is a limited stock of goods on hand and no large excess of productive equipment—as, for example, after a long period of business depression—an increase in consumer demand from one of many possible causes will create paper profits in industry. If banking conditions are favorable and promise to remain so, business expansion will follow. Industries which cater directly to the demands of the consuming public will be the first to feel the stimulus. Misguided by their profit and loss accounts they will borrow money, add to their fixed investment, and increase their inventories. They will set in motion new demands for labor, capital goods, raw materials, and semi-manufactured products. The prices of these products will rise, and paper profits will be created within the industries which supply them. Spreading from the higher to the lower industries, causing each to expand in turn, the effects will eventually reach down to the producers of basic products who will then set to work to increase their output. Thus paper profits at the top of the industrial ladder become the means of creating paper profits in industry all the way down.

While these effects are taking place, the "profits" of industry, in the face of a labor shortage which "profits" have created, break down the resistance of employers to the demands of labor. Increased wages and extraordinary dividend payments, both of which grow out of the misinterpretation of "profits," enhance the demands of consumers for the products of industry all along the line. In the spending orgy which follows, insatiable consumer demand, combined with the scramble to replace and increase inventory stocks, serves to start the same complex series of interactions all over again.

A series of this kind may continue with only slight interruptions so long as the supply of bank credit remains ample or, what amounts to practically the

same thing, until the increase in the stock of goods on hand has more than caught up with the successive increases in consumer demand. When this stage is reached, it is signalized by higher money rates—which induce consumers to save more of their income, especially if they too have borrowed on the strength of their increase in income in order to buy. It is further evidenced by large stocks of goods on the shelves and in process of being manufactured, and by the failure of business to continue to earn phenomenal "profits" in the face of increased costs and a reduced demand. It is then that trouble begins for industry. Having "taken" and spent its paper profits with the aid of bank credit, it is forced to slacken its pace and to devote its attention to making good these expenditures out of real profits. The task is rendered the more difficult by the fact that debts contracted at a high level of prices must be repaid out of real earnings on a lower price level.

In the recognition of paper profits for what they really are, industry has in its own hands the power to check unwise expenditure and overexpansion. It has the power to narrow by a substantial amount the spread between the price level of prosperity and the price level of depression—that is, it can, if it studies the matter carefully, smooth out many of the wrinkles in the business curve. For example, if business finds that a reserve equal to the difference between the cost of inventories at the end of the year and what the same quantity and quality of inventories would have cost at the beginning of the year absorbs a large part of the year's "profit," it should be recognized at once that it is no time to borrow money and declare extra dividends, to pile up inventories, or to make extensions to plant and equipment "out of profits." If business permitted itself to be guided by what remained of the profit and loss account after the required reserves were taken out of it, the danger signal of narrowing profit margins would be recognized at a much earlier stage in the business cycle, and, in fact, much of the cycle itself would disappear.

Conclusion

It is of special importance at the present time that business men give closer study to the proper and improper uses of paper profits. Conditions are still far from stable. In the process of recovering from the conditions of overextended plant and productive equipment inherited from the war, the general ups and downs in business seem to be coming with greater frequency, with small paper profits during one period of the year and paper losses at another period. Thus far in the process of readjustment, the results have been of a mixed nature. No particular industry or group of industries have enjoyed paper profits over a long enough period of time to be dangerously affected by them. Paper profits have quickly worked their own cure. Excessive plant capacity, business caution, and the prompt delivery of goods have seen to that.

It is hardly to be expected that this happy condition will continue from year to year after the country has once grown up to its present productive facilities, and the mortgage contracted during the war years has been finally lifted. With half of the world's monetary gold in our possession, there is always the possibility that business will be exposed to an attack of paper profits through currency inflation as a means of bringing about the redistribution of gold along more equitable lines. It is difficult to

see how the redistribution process can be effected in any other way, unless it would be through a fall in prices abroad. Nothing would contribute so quickly or effectively to the solution of the problem of excess gold as the appearance and use of paper profits on a grand scale in business—it is a way that paper profits have of tricking business men into dangerous paths when things are out of balance and reform and readjustment is needed.

The business man would also do well to reflect that the rise in prices of more than 50% since 1913 has contributed a paper profit of $50 for every $100 of inventory carried in that year. How many businesses have retained a substantial part of this inventory appreciation as a reserve against falling prices? One of the fortunate things for business balance sheets is that prices have shown no disposition to return to the 1913 level and thereby take away all paper profit of the war years. But what promise does this hold for the future? Will the level of prices after the next upswing in business afford as much protection to those who spend their paper profits as the level of 1921 seems to have afforded? Most business men feel, of course, that we are now on a permanently higher price level than that of 1913, and we probably are, but how much higher will it be after gold has been redistributed?

The many uncertainties in the situation suggest that every well-managed business should have a paper profit reserve for a part, at least, of its inventory accretions during the past ten years, while for future accretions it should build up dollar-for-dollar reserves. In practice, it might be difficult for all well-managed concerns to follow this course to the letter because of the necessity of competing with concerns which are lax in their accounting methods—concerns, for example, which would misinterpret the profit and loss account even if they knew the consequences. But the fact that competing firms may be expanding on the strength of paper profits should not be allowed to swerve the individual business man very far from the course above suggested. If competitors insist on weakening themselves permanently, the time comes when they should be given a free hand to do so without dragging others down with them. When they have spent their paper profits and are face to face with the necessity of paying off the mortgage, the business that has followed the conservative course of holding its paper profit in reserve can set a pace that improvident competitors will be unable to follow.

THE EXTENT AND APPLICATION OF PSYCHOLOGY AND PSYCHOLOGICAL METHOD IN ENGLISH INDUSTRIAL LIFE

By GEORGE H. MILES

ENGLAND has justly prided herself on the fact that she has led the way in measures for the amelioration of the lot of the worker, but until recent years this work has been prompted by humanitarian motives and good-will and has not been based on well-defined scientific principles.

Many and varied influences have contributed to bring about an increasing recognition of the importance of a scientific study of the human factor in industry. During the war the mistakes that were made in the treatment of munition workers showed vividly the lack of exact knowledge relating to efficient human labor, and emphasized the need for scientific investigation. In 1919 the Industrial Fatigue Research Board,[1] a government body, was formed to inquire into causes of industrial fatigue, and as its work progressed, the amazing complexity of the problems revealed itself. Its early reports chiefly concern hours of work in the heavy industries and the effects of ventilation on output. The effects of fatigue as measured by output records, sickness and mortality data, and accidents were studied by statistical analysis and by direct observation. In 1920 it extended its work to the textile industries, and from time to time reports containing most extensive observations showing the changes in output which accompany variation in temperature, humidity, and lighting have been issued.

The work of the board soon passed from the restricted study of fatigue to wider fields, and it now concerns itself with wide surveys of problems of interest to an industry as a whole or to a branch of an industry. Its terms of reference indicate the character and scope of its work: "To suggest problems for investigation, and to advise upon or carry out schemes of research referred to them from time to time by the Medical Research Council; undertake to promote better knowledge of the relation of hours of labor and of other conditions of employment, including methods of work, to functions of the human body, having regard both to the preser-

[1] Industrial Fatigue Research Board:

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Mona Wilson, J.P.

D. R. Wilson, M.A., Secretary. Offices: 15 York Building, Adelphi, London, W. C. 2.

vation of health among the workers and to industrial efficiency; and to take steps to secure the cooperation of industries in the fullest practical application of the results of this research work to the needs of industry."

Being a government body, however, it cannot undertake investigations for the benefit of individual firms. The value of its work was early realized, but the application of the general results to particular problems, calls, as in other branches of science, for persons specially trained in the science and acquainted with the firm's requirements. Such persons, however, working in comparative isolation for individual firms, would at this early stage find progress extremely difficult.

Private firms, too, are frequently faced with special problems which require a wide knowledge of likely methods of attack, the taking of detailed records to get at the actual facts, interpretation of the results, and careful experiments with new methods. Some means had to be devised to facilitate such research.

I

The formation of the National Institute of Industrial Psychology[2] in 1921 gave the means by which such requirements could be met. The Institute's funds were at first very limited, but by the generosity of a number of firms, private individuals, and by the help of a grant from the Carnegie United Kingdom Trustees, it was enabled to make a start. It was essential that this body should be as impartial as was humanly possible, and on its Council are men who are in the forefront of the industrial world, not as representing either employer or employees, but as assisting in furthering scientific inquiry into the

[2] National Institute of Industrial Psychology, founded in 1921 for the application of psychology and physiology to industry and commerce.

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Julius Salmon, Director of J. Lyons & Co., Ltd.

Winifred C. Cullis, O.B.E., D.Sc., Professor of Mind and Logic, University College, London.

S. C. Turner, F.C.I.I.

D. R. Wilson, M.A., Secretary of the Industrial Fatigue Research Board.

R M. Wilson, M.B., Ch.B.

Sir Robert Witt, C.B.E., F.S.A., M.A. (Vice-Chairman) a Trustee of the National Gallery.

human problems of industry. It further received the help and cooperation of prominent psychologists and physiologists throughout the country.

A statement of its aims runs concisely as follows:

> This Institute exists for promoting the study of the human side of labor, and for putting into practice the results of such knowledge. The whole of its income is expended in these objects.
>
> The Institute undertakes on behalf of industrial and commercial firms, private investigations under the following heads:
>
> 1. Movements of the worker
> 2. Arrangement of material
> 3. Methods of training
> 4. Distribution of periods of work and rest
> 5. Effects of illumination, ventilation, and so forth, on efficiency
> 6. Interest in work and the reduction of monotony
> 7. Tests for the selection of the most suitable workers for different kinds of work
> 8. Reduction of waste

The Institute has a number of investigators whose whole-time services under direction and supervision from headquarters are available for periods varying from three months to two years. These investigators are visited periodically by the director and assistant director; their problems are discussed or new lines of investigation suggested. They are also in direct touch with headquarters, forward monthly reports, and can at any time receive advice on any difficulties that arise. In this way each problem receives special treatment and all available information is brought into service to aid in its solution.

These two bodies, the Industrial Fatigue Research Board and the National Institute of Industrial Psychology, represent the organized forces which include in their work or have as their direct aim the application of psychology and psychological methods to industry.

II

Less direct but wide-spread influences are at work, all of which tend to further the application of psychological principles and methods. Most of the progressive firms have introduced what is perhaps unfortunately styled "welfare work." Such problems as labor turnover, sickness and accident causation, employment management, and the safety of employees are, among others, receiving far more expert attention than formerly, and it is significant that more and more attention is devoted to the psychological aspect of these questions.

One of the first essentials of success in the application of psychology is that the psychologist shall have full cooperation of both management and workers. This is impossible if the general aims and principles of the work are not understood, and much has been done to spread this knowledge.

At the Universities of Birmingham, Edinburgh, Cambridge, Liverpool, Manchester, and London, lectures on industrial psychology are given, while definite courses in industrial psychology which are planned for students who are taking the diploma in industrial psychology are also open to the general public at the London School of Economics. These lectures are given by members of the staff of the National Institute of Industrial Psychology and the Industrial Fatigue Research Board.

Members of the Institute's staff and Council have also done much to spread a knowledge of the possibilities and the actual achievements of industrial psychology by lecture talks to Rotary Clubs, Luncheon Clubs, Trade, and

Trade Union organizations, and similar bodies. The Institute has also arranged lectures and demonstrations of its methods for the benefit of its members. Wide-spread interest has also been aroused by a number of short talks prepared by the Institute and "wirelessed" by the British Broadcasting Company.

For some time past conferences have been organized by a number of bodies interested in industrial problems. Representatives from firms throughout the country attend these meetings and the increasing amount of time that is devoted to the human aspect is indicative of a growing general interest.

On the scientific side too there has been a marked extension of activity. The early work of the Fatigue Board was limited in scope, but in Report Number 10, issued in 1920, there is an indication of an extension of the Board's work and an experiment in the efficiency of rest pauses and relay working is described. Time and movement study investigations followed, and very marked increases in output were shown to follow improvements in methods. Accident causation, questions concerning temperature, ventilation, and humidity have since received wider attention. The 29 reports of the Board that have been issued give some indication of the variety and extent to which psychological methods can be applied in industrial investigations.

A further indication of the varied activities of the Board will be gained from a list of its committees for the year 1925. There are scientific committees on industrial health statistics, physiology of muscular work, and industrial psychology. Special committees deal with postoffice work, accident causation, optimum length of spell, physiology of ventilation, design of machines, industries specially affecting women, and sickness in cotton weaving. It is significant that (excluding the committee on industrial psychology) on five of these committees psychology is represented, and a study of the reports issued will reveal the fact that in every case psychological problems crop up repeatedly. It is becoming increasingly apparent that no problem concerning human activity can be satisfactorily approached without taking into account the psychological factors of the situation.

III

Definite achievement has been necessary, however, in order to effect the transition from the theoretical stage to an acknowledgment of the utility of the practical application. The early work of the National Institute of Industrial Psychology was, therefore, necessarily limited to problems where a very definite and easily measurable result was possible. The success which followed its early investigations, coupled with the spread of information concerning the possibilities of this work, led to a marked increase in the number of investigations which it was asked to undertake. Another difficulty to overcome was the inherent inertia of the type of employer who, while willing to admit the value of the work in industries other than his own, was sure his own was too complicated or would not lend itself to such methods. Even in this matter the Institute has been able, by the number and variety of its investigations, to show that psychology can with advantage be applied at every phase of industrial life.

A brief account of its activities will show the wide extent of this work and the success which has followed.

In many of the Institute's investigations movement study forms an impor-

tant item, and by such work in a margarin factory a time saving of 37% was obtained. In assembly work novices trained along lines suggested by the Institute showed an increase of efficiency of 21% over a corresponding group trained by the firm's instructor. Output at the coal face has been improved by 16% and maintained over a long period by training in better methods of picking. Generally this movement study has drawn attention to the need for improving layout and appliances. Too frequently the mechanical aspect has, in industry, been stressed to the disadvantage of the worker. Thus a polisher's bench when redesigned allowed an increase of output of 21% to be obtained. A new packing bench reduced fatigue so markedly that the workers spontaneously thanked the investigator, and an increased output of 36% was obtained. This has been maintained and even increased over a period of three years. The awkward work of "bagging" in a cake mill was so facilitated that an increase of 50% followed, and the workers asked for a further extension of the improvements. These are but a few of the instances of the results that have followed improvement in the workers' immediate environment—bench, tools, and so forth. Many investigations have been concerned with the general factory layout, and here the improvements that have been effected have frequently been due to the reduction of annoyance and ill-feeling between workers which faulty layout engenders. In seven different departments of a firm, improvement in the layout and equipment and a better distribution of work produced increases of 12%, 14%, 18%, 23%, 31%, 32%, and 36%. In a cabinet factory, investigation showed unproductive time and a considerable reduction in working rate, due to irritating interruption, of a type the magnitude of which was quite unsuspected. By a rearrangement of methods, unproductive time was minimized and the firm reduced the retail price of its goods by 25%.

In most up-to-date establishments there is a constant war against waste, and on several occasions the Institute has been called in to assist. "Carelessness" and "lack of conscientiousness" are the terms frequently applied as "explanations," but it is generally found that physiological and psychological factors, fatigue, irritation, defective lighting, and ventilation play so large a part that when conditions are improved, waste is enormously reduced. In one factory a reduction of £8 per day in waste was accomplished; in another a 37% reduction followed. A 53% reduction in one case and a 44% reduction in another catering establishment followed the removal of sources of irritation and hindrances, and the introduction of improved methods of handling.

IV

All who have carried out experimental work of this type will realize that these results, useful though they are, do not by any means measure the whole of the improvement effected. At each investigation the methods have been closely watched by management and workers, and in every case this has led to the examination of many other problems from a new standpoint. Workers and management have become interested in the subject and have frequently asked advice for wider reading. It has been the Institute's aim to encourage in every possible way the continuance of the work, and arrangements are made wherever possible for the investigator to visit the firm at intervals to assist in any modifications that may be necessary and

to obtain a gage of the real efficiency of the methods introduced. Several firms have been so convinced of the value of the work that they have engaged works psychologists. Others have sent members of their staff to the University or to the Institute for training. Perhaps the biggest difficulty that the Institute has had to face has been the appointment of suitable investigators. The work is exacting. There is a constant struggle between the rigid and exact requirements of scientific method and the tendency to accept approximations which fluctuating industrial requirements sometimes impose in spite of all care. Tact in abundance is essential, as is also an adaptability to physical environment. One investigator, for instance, followed work in a coal mine with inquiry in a printing works and from there has gone to a flax mill.

V

During these investigations many problems have arisen which have required the help of laboratory research. In one case lighting questions in the coal mine led to laboratory work with a number of miners as subjects, followed by further work of application of results at the coal face. After this investigation an increase of output of over 14% was obtained. Each investigation is thus adding to the amount of exact knowledge concerning industrial conditions and the best methods of applying psychological principles, though, of course, much more must be done before it will be safe to generalize from the experience gained, or even to touch the fringe of the more vital problems which are dimly discerned, but for which at present the psychologist has apparently no adequate method of attack.

An important section of the Institute's work is that dealing with vocational selection. The detailed investigations carried out by the Institute have repeatedly shown marked differences in individual ability of the workers. This fact is, of course, recognized in all industrial work, but many of the Institute's investigations have shown that these differences are much greater than the general output records or earnings of a group indicate. There is in every group of workers, even when working on piece-rates, a leveling tendency due to many causes, and frequently the differences are concealed, but the close observation which the investigations have necessitated have shown that these individual differences are much more marked than the management had suspected. The fact still further emphasizes the importance of careful preliminary selection, and a number of firms have sought the Institute's assistance in the introduction of psychological tests designed to supplement their own methods of selection. Tests for clerical workers, dressmakers' apprentices, pipers, packers, engineers, solderers, tapestry workers, and so on, have been prepared and are now in use.

The methods of preparing these tests have varied. The engineering tests were first developed and tried in a large technical school. Then more work was carried out in two large engineering establishments, and suitable modifications were made. In other instances the Institute's investigators have made a job analysis, on a psychological basis, themselves worked at the job, devised suitable tests, proved their value by the usual methods, and then trained a member of the staff of the firm in application and evaluation. Some firms have, in addition, sent members of their staff for a course of training at the Institute. It has, of course, been necessary to adjust the character of the tests not only to

the nature of the job, but also to the ability of the staff to apply them. Where competent, trained psychologists are available, much more thorough and scientific tests are possible than in cases where only little psychological knowledge exists. In the latter case, it has been essential that the tests should be simple, easily applied, and a very definite routine has been set out. In addition, an investigator from time to time visits the firm to give advice and further assistance if required.

Perhaps in no other branch of application is the work apparently so easy and yet in reality so difficult. The Institute has strenuously opposed and repeatedly warned firms of the danger of introducing ready-made tests.

The question has sometimes been asked why the psychologist should devote so much of his time to what are apparently such trifles as selection, movement study, rest pauses, and so forth, when there are so many urgent and vital problems awaiting solution. May not these bigger issues have their solution, at any rate in part, in the problems which the psychologist is even now studying? Undoubtedly working environment plays a far greater part than is usually suspected in the harmony of life. Unpleasant, irritating conditions of work, routine, monotony, with the utilization of only a fraction of the workers' available mental and physical activity and no legitimate interest beyond a very limited sphere, repeated day after day, must in the end tell on a man mentally, morally, and physically. The excesses outside the factory or office are frequently a natural reflection of the repression within. These conditions are the outcome of unrestricted development on the mechanical side of industry and a lack of accurate knowledge of the needs of the human element. It is significant that the workers themselves are often most conservative and little desirous of change, having grown up with and tolerated, conditions which are detrimental to their well-being.

The industrial psychologist in England is wrestling with these problems in the light of more scientific knowledge and endeavoring to improve conditions, slowly, it is admitted, but surely, and at the same time applying his principles in ways that are economically sound and which will benefit not only the individual worker, but ultimately the whole community.

SOME BUSINESS ASPECTS OF "ADEQUATE TRANSPORTATION SERVICE"

By CARSON S. DUNCAN

ON April 5, 1923, the chief executives of the principal railroads of the country met in New York City and agreed upon the first comprehensive concerted and cooperative program that has ever been undertaken in the history of the carriers.

The purpose of this concerted and cooperative program was "to insure, to the highest degree practicable, adequate provision for the country's transportation requirements." Specifically, it was agreed by the executives to set the goal of 5% of freight-cars out of repair and 15% of the locomotives out of repair, and to secure, as nearly as possible, 30 miles per day per car movement and 30 tons as an average load per car.

It was announced at the same meeting that Class I railroads had authorized expenditures for equipment and other facilities of approximately $1,100,000,000 for the year 1923, of which $515,000,000 was for cars, $160,000,000 for locomotives, and $425,000,000 for trackage and other facilities.

In a word, the object of the cooperative action by the managements of the railroads was to secure and to maintain adequate transportation service for the increasing traffic of the country. By adequate transportation service was meant: to have with certainty the right kind of car, in proper condition, at the right place, at the right time, and to make prompt delivery of the shipments at the point of destination. The transportation service was thus to become adequate, efficient, and dependable.

It is here proposed to discuss some of the results of this concerted, cooperative program on the part of railroad managements, as they have been revealed in the movement of traffic, and in the business practices and methods of producers, merchants, manufacturers, and bankers.

I

The railroads themselves present both tangible and intangible results of the movement to afford the shippers of the country adequate transportation service. The total capital expenditures made by railroads of Class I since 1922 have amounted to $2,363,165,490. There has been, as a result of these expenditures, a gradual extension of main and secondary tracks; and, from January 1, 1922, to August 1, 1925, there have been 8,728 new locomotives and 534,508 new cars put in service. Furthermore, the number of cars and of locomotives out of repair has been held down to a low figure. More than $940,000,000 has likewise been expended in roadway and structures, for additional track, heavier rails, on shops and engine-houses, for additional ballast, and for other improvements.

It is also on record that there has been no general shortage of freight-cars at any time during the past two years and a half. Commendation of adequate transportation service in this respect has been publicly given by shippers in all parts of the country. Furthermore, not only have the railroads carried an al-

most unprecedented amount of traffic, but there has been a substantial surplus of cars and of locomotives in good order and ready for service practically throughout this entire period.

While there are no facts available upon which to base a general quantitative measurement of the expedited service which the railroads have offered the shippers, general experience has attested to this fact. Traffic has moved more swiftly from point of production to market; cars have been passed more speedily through yards and junction points, and the loading and unloading of cars has been more prompt.

There has been, therefore, an adequate supply of cars and locomotives to handle the traffic offered the steam railroads of the country as a result of this concerted, cooperative movement by railroad management. Through the cooperation of shippers, cars have been loaded and unloaded with greater promptness, and the railroad officials have cooperated in expediting the movement of traffic while under their jurisdiction. Time schedules have been maintained. Adequate transportation service is an accomplished fact.

Transportation touches upon and affects most of the important phases of the economic movement of goods from source of production to point of consumption. What, therefore, have been the effects of adequate, efficient, and dependable transportation service upon business generally?

II

As indicated above, in order to carry out the comprehensive concerted and cooperative program and afford adequate transportation service to the shippers of the country, it was first necessary to have an efficient transportation machine throughout, which, in turn, called for the capital expenditure of a vast sum of money. There has been an average annual expenditure during the past four years of more than $788,000,000 by Class I railroads.

The railroads have thus become an important business factor through their large purchases of materials and supplies of various kinds. In 1924, for example, the carriers purchased fuel at the cost of more than $471,500,000; forest products at the cost of $180,872,000; iron and steel, more than $365,000,000; and miscellaneous, more than $324,900,000.

It is estimated that the railroads, in 1924, purchased 26.1% of the total bituminous coal produced, 5.2% of anthracite coal production, 27.5% of the entire steel output, and 25% of the total lumber production. These purchases were certainly an important element in the business activity of 1924.

The first business effect of this nation-wide cooperative effort was the elimination of car shortages. After the first quarter of 1923, there has been practically no car shortage of any kind anywhere in the country.

This elimination of car shortages has profoundly affected business generally. Its results may be called preventive savings or savings by the prevention of losses. The producers of perishable products, such as fruit and live stock, have not suffered the loss by deterioration or decay that formerly resulted from an inability to secure cars when they were needed. Mines have not had to shut down because of a lack of cars. It has prevented temporary sellers' markets with a consequent enhancement of price to the consumer. It has practically banished the uncertainty of filling orders and the receiving of shipments.

That these preventive savings are of

a substantial character may be seen from the fact that a differential between markets of from 8 to 15 cents per bushel in export grain existed during the car shortage of 1922. It has been estimated also that the retail price of coal in the same year was increased by lack of transportation facilities equivalent to an increase in freight rates of 50%.[1] The Secretary of Commerce is responsible for the statement that "there would be no difficulty whatever, by basing such losses on the experiences we have already had, to calculate a loss to the American people of a billion dollars for each one of these periodic transportation shortages."

No explanation has been made public as to how the above stupendous sum was arrived at. It is evident, of course, that there would never have been the enhanced prices in the market if there had been no car shortage, and the market would probably not have absorbed the commodities produced, at the advanced price. Perishable products delayed beyond the period when ready for shipment unquestionably entail a loss on their producers. The consumers pay the enhanced price. Those dealers who were able to secure any such commodities or had them in stock no doubt realized a handsome profit. Many lose but some gain in these "intermittent strictures in the law of supply and demand." Embargoes have disrupted sales contracts and made for greater business uncertainty.

On the whole, the almost complete disappearance of car shortages and of transportation shortages where motive power, additional and switching trackage, and terminal and yard facilities are involved, has been of great benefit. Commissioner Hall no doubt correctly represented the shippers' attitude when he said that "to the shipper no sin of the railroad is as heinous as the failure to meet the primary duty of a common carrier, to accept and transport commodities as offered in the usual course of business."

[1] Secretary Hoover in address before United States Chamber of Commerce, New York, May 8, 1923.

III

Adequate, efficient, and dependable transportation service has had other effects than the practical elimination of losses due to the "intermittent strictures" caused by car shortages. Just as when the channel of a stream is cleared of rocks or brush or other obstructions, it is found not only that there is no longer any back water, but also that the current flows more swiftly onward, so by homely illustration is pictured the swifter movement of traffic when the sidetracks, yards, and terminals are kept freely open. Adequate transportation service has meant a more expeditious service from point of origin to destination as well as ample facilities and dependable schedules.

From these factors have developed far-reaching results that are not yet fully understood but are well worth careful consideration. These results have materially affected certain business methods and practices, and have likewise been the source of substantial savings, which may be called constructive savings as distinguished from the preventive savings discussed above.

The two elements of adequate transportation service which will be particularly discussed are its dependability and its expeditiousness. The dependability of service, although of fundamental importance, as will be readily recognized, can be dealt with quite briefly. Shippers in all parts of the country have

publicly stated before the various Regional Advisory Boards that the freight service afforded by the carriers has come to be accepted as regular and to be relied upon. The immediate fear of embargoes has vanished. The time schedules are lived up to in a manner probably never before equaled. Contracts for delivery at specified times are now entered into with reasonable confidence. Manufacturers and merchants have reached the point where the continuity of operation and the fulfilling of sales contracts depend from day to day upon the regularity of traffic movement. Linked with expedited service, the dependable freight service is producing such wide-spread changes in business practices and methods as to suggest the idea of a "silent revolution." [2]

We are now in a position to outline various results in business operation arising from a sustained expedited transportation service.

1. One of the most striking effects of the dependable expeditious freight service has appeared in the so-called "hand-to-mouth" buying methods that have very generally prevailed. It is a practice which was begun before the present level of service was reached, but it has continued undoubtedly as a result of such service. The losses from 1920 inflated inventories and the unsettled market conditions of 1921 were the real causes of these business practices.

Hand-to-mouth buying means generally the making of purchases to take care of immediately prospective sales or needs. The practice applies to purchases of commodities by retailer from wholesaler, by wholesaler from manufacturer or producer, and of material and supplies by the manufacturer.

Evidence of this practice is discovered in many lines of business. It has been commented on frequently by writers on current business activities. One such writer says that "hand-to-mouth buying has come to be accepted as a relatively permanent feature of merchandising."

A plain indication of this purchasing only for immediate needs would be disclosed in lower inventories. The secretary of the National Lumber Manufacturers' Association is authority for the statement that the retail lumber dealers now carry three billion less board feet in stock than formerly. The decrease in stock has been estimated by one lumber dealer as equivalent to $600,000,000 decrease in tied-up capital. A leading department store in St. Louis is reported to have carried a million dollars' less stock in 1923 and 1924, despite a larger volume of business, than

[2] The following examples are illustrative:

The chairman of the Ore Committee, Trans-Missouri–Kansas Regional Advisory Board, recently declared that the time required for delivery of ore from the mines in that district to the LaSalle Smelter Group in the Illinois field was formerly about 15 days, but had been reduced at the present time to about 7¼ days, or a reduction of more than 50% in the transit time.

As reported by the secretary of the National Lumber Manufacturers' Association, before 3 years ago the average time in transit of lumber moving from mill to retail yards was about 50 days, while now the average time is from 15 to 20 days. In this industry, at least three-fifths of the transit time has been cut away by more expeditious service.

A live stock man in Idaho testified not only that the live stock shippers in his district had been able to receive cars whenever asked for and without delay to the shipments, but also that the service after loading was more expeditious, in that formerly the regular time for shipping sheep from Salt Lake City to Chicago was eight days and now had been cut to seven.

It is reported by a railroad system that it has handled "annually 15,000 cars of cantaloupes out of the Imperial Valley of California to Chicago and certain points" and that "this entire traffic moves like clockwork on a schedule of 154 hours from Colton, California, to Chicago, Illinois."

For the country as a whole the reduction in the average time of transit via the railroads has been variously estimated at from 25% to 40%.

in 1922. A large manufacturer in Pittsburgh has been able, through dependable and expedited freight service, to reduce his stock of steel from $300,000 to $75,000 and other materials from $600,000 to $300,000. In Toledo, Ohio, a bottle manufacturer has cut his glass-making materials stocks in two, and his coal stock by two-thirds. One manufacturer of automobiles reported the value of its inventory reduction as "several million dollars."

It is also reported that one large manufacturer of automobiles with an assembly plant in the Twin Cities which turns out 500 cars each day, now carries the parts directly from the cars to the assembly floor, without using its large warehouse. The National Biscuit Company and the American Tobacco Company are said to be able to avoid carrying stock in many cases, the shipments going to immediate consumption. Five-and-ten-cent stores in New York City are able, by means of the present dependable and expedited freight service, to keep their stocks down to a point where they can be turned over in two or three days. A jobber of sanitary ware in a city near Chicago has reduced his stock to a minimum, relying for emergency orders, which he is unable to fill from his depleted stock, on overnight deliveries from Chicago.

These are examples from various parts of the country of a practice that must be wide-spread and of great cumulative importance. It cannot yet have become a universal practice, however, because the reports of the Federal Reserve Board do not show a material decrease in stocks from retail establishments covered in its survey.

2. Reduced stocks must mean a decrease in the amount of money tied up in inventories. How much this would be in an aggregate sum there is now no way to ascertain. It must mean also a decrease in the length of time that money is tied up in commodities while in transit. What this would be in total aggregate there is now no basis for determining. Some examples, however, will suffice to show that the savings in interest on materials, supplies, and goods ready for sale are of large proportions.

The reduction in stocks of retail lumber dealers which has been valued at $600,000,000, would mean a saving, at 6%, of $36,000,000. The same dealer who made this estimate thought there must be a reduced inventory throughout the country for all merchants of a value equal to $3,500,000,000, by calculating the average value of all goods per ton at 50% of the value of lumber per ton. Another estimate is a saving of $32,000,000 a day in reduction of time in transit.

A manufacturer in the Southwest had to borrow annually about $400,000 from the bank to carry his materials and stocks, but through dependable and expedited service he is now able to carry on wholly independent of the bank.

In the mining field a copper producer has declared that the cutting down of time in transit from an average of 27 days to an average of 13 days represents a saving to him that goes far toward paying his total freight bill.

Wholesale and retail dealers interviewed in New York, Boston, Pittsburgh, Brooklyn, Albany, Toledo, Detroit, and New Haven, reported their ability, during the past two years, to reduce their average stock, due to more dependable and expeditious service, thus saving substantially in interest charges, storage charges, and insurance. The department store in St. Louis that has been able to cut down its stock on hand by a million dollars finds that the

saving in interest is sufficient to pay the entire freight cost on goods purchased.

This more rapid turnover of stock, reduced inventories, and curtailed time in transit has a reflection in banking circles. Obviously, if each dollar turns more rapidly, it does more work for merchant and manufacturer, and a smaller number of dollars will be required. It has been suggested, therefore, that the dependable and expeditious freight service has been an important factor in making the money market "easy."

This fact has been attested to by the president of the Continental and Commercial Bank of Chicago, who pointed out in a recent open business letter that there is a close connection "between efficient transportation of merchandise and easy credit conditions."

E. O. Howard, of Walker Bros., bankers, Salt Lake City, said before the Central Western Regional Advisory Board at a meeting held in Boise, Idaho, on July 16, 1925:

> This organization has brought to my attention and answered one question that I was never able to answer very intelligently, and that is, what has created continuously the enormous reservoirs of cash accumulated in the United States? There are still enormous quantities of money unemployed. As near as I can arrive at it, one reason for that is the fact that the railroads are now transporting freight so much more successfully and so much more quickly that capital is not carried into inventories, and, therefore, that capital has been released.

This situation would appear to justify the statement that just as the elimination of car shortages is estimated as resulting in preventive savings of a billion dollars to the American people, so the constructive savings through ample, dependable, and expeditious service might aggregate another billion dollars.

3. In addition to what has been said about the actual and possible savings in the cost of doing business, there is the wide-spread general satisfaction to the manufacturer and producer, to the wholesaler and retailer, in being able to carry on his business with little worry about the transportation of his goods becoming an obstructing or controlling factor with which he must reckon. They are all reaching the point where they take dependable and expeditious transportation service for granted.

This confidence is helpful in stabilizing a business policy and in quickening business all along the line. Attention can be centered under the circumstances on problems of production and of markets.

The consumers, also, whether they are aware of it or not, are afforded a more stable market, steadier prices, and are not to be deceived by any false excuses by retailers that they are not able to get orders filled.

4. Adjustments, however, are required to meet the new conditions created by expeditious and dependable freight service. Hand-to-mouth buying means a decline in long-term contracts, and such contracts are themselves a strong factor in stabilizing business.

Fruit and vegetable canners are complaining because they do not place the six- or nine-month contracts with wholesale grocers as was the former custom. They say that they are now really doing the wholesalers' job, in that they take the risks and carry the surplus stocks from the time of canning until the wholesalers order goods for immediate delivery to retailer. The wholesalers defend their policy on the ground that the retailer now does not buy ahead as he used to do, and that there is no need for them to carry surplus stocks now since the goods can be received and delivered promptly.

Prior to 1917, when the custom was

disrupted by wartime conditions, about 65% of the bituminous coal moved under contracts covering a large part or all of the coal year. The stabilizing effect of such a factor is apparent. But now the contracting has greatly decreased since prompt shipment and prompt receipt of the shipment seem assured.

The same influence is at work in other lines of business. Results of a questionnaire sent out to the manufacturers in its district by the Federal Reserve Bank of Cleveland indicate the existence of the practice everywhere. The president of the Kay Copper Company testifies to the practice in the copper industry. It has been repeatedly discussed in the textile industry.

Evidence indicates that the wholesalers and retailers are finding this new policy a profitable one. They require less capital, realize faster turnover of stock, have fresher stock on the shelves, and do business generally at lower costs. Objections to it, however, are advanced by the manufacturer. The objections offered are, briefly, that the manufacturer is left without a basis of knowledge as to market demand upon which to found a production schedule, that his costs are increased through producing in smaller lots or carrying larger inventories, that plants producing goods on order do not receive advance notice required to fill orders promptly and satisfactorily, that producers of seasonal goods are rushed at certain periods and without business at others, and that prices as between manufacturer and dealer are kept in a disturbed state due to constant dickering over the small, frequent purchases.

Adjustments, therefore, are more difficult for the manufacturers than for any one else. Since they cannot force the dealers to buy ahead, it would seem necessary for them to seek some means of meeting the new conditions. They must get nearer the ultimate market for their goods;[3] they must analyze it for themselves; they must formulate the production schedules on their own first-hand knowledge of future needs as a substitute for dealers' future orders. If this is done, there will likely result a closer relationship between the retailer and the manufacturer, and both the wholesaler and retailer will have some readjusting to do on their own part.[4]

5. There have been other changes incidental to dependable, expeditious freight service. One of these is the decline in demurrage charges from 68 cents per freight-car loaded in 1920 to 43 cents per freight-car loaded in 1924.[5]

The claims resulting from loss and damage to freight shipments while in

[3] The salesman for a textile manufacturer recently reported that up to 1919 he made yearly two trips through the Middle West, taking orders for the dealers' needs six months in advance. Now he makes six trips each year. He declared that he paid three times as much as formerly in Pullman fares, railroad fares, hotel bills, and general traveling expense. His factory, however, made more money in 1924, through a big turnover with a narrow margin, than in 1918 at high prices. This frequent contact with the trade, this closer touch with the market, ought to afford the manufacturer one means of securing the necessary market information upon which to base a production program.

[4] An interesting experiment was undertaken during the past season by the sheep and lamb producers in the district covered by the Central Western Regional Advisory Board. By the cooperation of the railroads and the shippers it was possible to secure the data on arrivals in the various markets and the number of cars ordered for shipping lambs and sheep. The program resulted in more orderly marketing and, as claimed by the sheepmen themselves, the saving of at least a million dollars. This is a sample of what may be done by the producer when he undertakes to reach a first-hand acquaintance with his market.

[5] Demurrage revenue, 1920, was $30,505,039; 1924, $21,032,518. Freight-car loadings, 1920, 45,118,472; 1924, 48,527,227. Commission Reports and Car Service Division, *Annual Bulletin*, 1924.

transit on the railroads have also shown a decline during the past three years. This situation has been brought about by active cooperation between the railroads themselves, their officers and employees, and the shippers and receivers of freight. There has been better packing on the part of shippers, and more care has been used in the handling of shipments on the part of railroad employees. The figures show that the loss and damage to freight has been reduced from $137,000,000 in 1920 to $50,000,000 in 1924 for the railroads as a whole.[6] During the first six months of 1925 loss and damage claims amounted to $20,380,879, although the number of cars loaded with revenue freight in those months was the greatest ever handled by the carriers during any corresponding period.

The swifter movement of freight from point of origin to destination has created the need for a more expeditious means of clearing the bill of lading through the banks. Reports come from different parts of the country to the effect that frequently the freight arrives before the bill of lading, and the unloading of the cars must be delayed until the bill of lading arrives. Sometimes this delay is so long that demurrage is required on the waiting cars. Instances are given of the movement of freight to short destinations where the shipper cleared his bill of lading through a local bank that, in turn, cleared it through a bank in a larger center, thus delaying the bill for a period of from three days to a week after the shipment reached its destination. Expedited freight movement makes it necessary for banks to change their methods of handling bills, especially on shippers' order shipments.[7]

This calls to mind a final point, namely, that through the dependable, expedited freight service shippers are turning more and more from express to freight, with a substantial decrease in transportation charges.

This survey of some business aspects of adequate transportation service indicates clearly the fundamental character of that service and the daily dependence upon regularity of service by many merchants and manufacturers. If the railroads for some reason, say, lack of revenues or inability to secure capital for necessary improvements, should become unable to maintain the high level of service which they are now affording, those merchants and manufacturers, who depend for their daily operations upon daily deliveries by the carriers, would have to make quick adjustments or else they would find themselves without goods or without materials for their factories.

The process of adjustment made necessary by dependable and expedited freight service presents, therefore, a most interesting economic phenomenon. If such service is maintained, its effects will finally be felt by every manufacturer, merchant and producer, large and small, in every part of the country. For him who intelligently adjusts his business to the new condition there are possibilities of saving and there is greater stability of business than could be found in the old condition.

[6] To some extent the decline is due to decrease in commodity prices.

[7] A case of this kind was reported recently from New England to a member of the Commission. In this case carloads of feed stuffs arrived before the bill of lading came through and some demurrage was collected on the waiting cars. In replying to the complaint, the commissioner said that the only suggestion which occurred to him was to send the bill of lading by freight instead of through the mail.

THE MOTOR BUS SITUATION IN 1925

By MURRAY W. LATIMER

RECENT spectacular developments in air transportation and in wireless communication have tended to obscure a scarcely less rapid and possibly not less significant change in our methods of conveyance by land. The quietness of this change illustrates again the unconcern with which American people adapt themselves easily and quickly to striking developments in science and industry. In many instances the motor bus, the instrument of the revolution, has been allowed to operate practically unhampered by regulatory bodies, courts, tax collectors, or the public. The rights of monopoly of situation, which had been granted to street railway systems either by franchise or by a public opinion backed by the wisdom of years of experience, have been invaded in many localities with impunity.

Has this new development strengthened our transportation system? Is the bus to be a permanent part of that system? And, if so, what functions will be assigned to the bus?

Even before the inroads of the busses, street railway transportation had been weakened by the automobile to such a point that few street railway systems were able to keep pace with the rapid industrial growth of the areas they served. There is, therefore, another question: In the new scheme of things will the bus take the place of the existing utilities,[1] or will the street railway systems withstand the shock of the first attack and finally turn the methods of the invaders to their own ends?

In this study the recent history of motor bus transportation will be analyzed from five points of view: (1) the size of the industry; (2) the uses to which the motor bus has been put, with the available evidence as to its success or failure in those uses; (3) English and early American railroad history; (4) the statutes and the court and commission rulings which bear upon bus transportation; (5) and the costs of conveyance by motor bus as compared with costs of conveyance by trolleys and steam railroads. Because of the relative scarcity of data, no final conclusions can be reached in the fifth part of the analysis. But it is imperative that we examine the available facts, because, ultimately, costs will have most to do with the determination of the economic importance of the bus industry.

I

Statistics of any rapidly changing industry, especially a new industry, usually are subject to a large margin of error. This probable margin of error is increased in the case of the bus industry by reason of the remarkable flexibility of that industry, one of its most outstanding advantages; the mileage of the routes over which busses are operated can be expanded or contracted, almost without limit, overnight. And, since data on the industry are meager, mileage of routes is of necessity an important figure in an effort to get an idea of the magnitude of the industry.

[1] The terms "utilities," "street railway systems," or "street railway utility" as used in this article include trolleys, subways, and elevated railways whether operated by the same management or independently.

TABLE I. NUMBER AND MILEAGE OF ROUTES OF MOTOR VEHICLES OPERATED IN THE PUBLIC SERVICE IN THE UNITED STATES ON JANUARY 1, 1925*

Operated By	Number of				Number of Routes	Mileage of Routes
	Companies Operating	Busses	Taxicabs	Stage Coaches		
Independent Bus Companies	6,551	13,959	3,455	3,107	7,791	179,415
Electric Railways	193	2,844	....	....	598	5,088
Hotels	182	237	....	....	....	669
Industrial Companies	11	23	....	....	....	346
Schools	2,581	13,223	....	....	....	....
Tourist Bus Lines	167	1,071	....	....	....	14,862
Total†	7,104	18,134	3,455	3,107	....	200,380

Bus Transportation, Vol. IV., 1925, p. 76.
†Exclusive of schools.

The data in Table I, as of January 1, 1925, from a recent number of *Bus Transportation*, show something of the size of the industry.

To compare the mileage of bus routes with the mileage of steam and electric railways would create, of course, erroneous impressions. The figures, incomplete as they are, without any comparisons suggest in themselves an industry of large importance.

Unfortunately, there has been no effort made to collect, periodically, from all operators, data on aggregate bus miles, passengers carried, and passenger miles. On the basis of answers to questionnaires sent to bus operators, a writer in *Bus Transportation* [2] estimated that, exclusive of school children, 2,500,000,000 persons were carried by busses in the year 1924.

The writer attempted to check this estimate by translating the following data of the actual bus operations of 38 electric railways into terms of the whole industry. These data are reproduced in Table II.

TABLE II. OPERATING STATISTICS OF BUS OPERATION OF 38 ELECTRIC RAILWAYS IN 1924

Total passengers carried	47,278,691
Miles of route	658
Number of busses owned	497

Two estimates were made; it was assumed that the number of passengers varied (1) according to the mileage of routes, and (2) according to the number of busses operated. On the basis of the first assumption, an estimate of more than 14,200,000,000 passengers may be obtained. The figure obviously is greatly excessive since the 38 street railways operated one bus to about 1.3 miles, whereas the average, as shown by Table I, is one bus to approximately 11 miles.

On the basis of the second assumption, the bus industry (excluding taxicabs, stage coaches, and school busses), seems to have carried about 1,720,000,000 passengers. While two such widely diverging estimates are of little value in themselves, they, at least, indicate that the estimate of 2,500,000,000 is not excessive.

Aera, the official publication of the American Electrical Railway Association, reported in May, 1925, that 370 street and interurban railway systems

[2] *Bus Transportation*, Vol. IV, 1925, p. 77.

carried over 13,400,000,000 passengers in 1924. The gross revenues of these companies were about 85% of the total for the industry.

During 1925 the bus industry has continued to grow at a rapid rate. For example, in September, 1925, 249 electric railways were operating 4,437 busses over 11,668 miles of route.[3] It is safe to assert, therefore, that the bus industry, which five years ago was of negligible proportions, has grown to a point where it carries from 15% to 20% as many passengers annually as are carried by the entire electric industry.

II

Before a further discussion of the varied ways in which motor busses have been employed in the United States is attempted, it may be advantageous to set out a somewhat general classification of uses, which, while not exhaustive or exclusive, will serve as a basis for discussion.

Motor busses have been used to:

1. Provide urban transportation,
   - (*a*) in direct competition with existing lines;
   - (*b*) in newly developed urban areas and subdivisions;
   - (*c*) in supplanting trolleys (or elevated or subway service)—
     - (1) in crowded districts where trolley service inconvenienced traffic, was slow, or had a badly planned route,
     - (2) on non-profitable lines, when large expenditures for renewals became necessary, or when sudden shifts in traffic caused excessive losses;
   - (*d*) auxiliary to trolleys in order to render unnecessary such steps as building switches or additional tracks, elevated railways, or subways, or in order to facilitate transfers.
2. Provide interurban transportation,
   - (*a*) in establishing entirely new interurban connections;
   - (*b*) in supplanting interurban trolleys or electric trains;
   - (*c*) in utilizing routes other than those over which trolleys or trains travel and so avoiding direct competition, although still violating the law of natural monopoly of situation;
   - (*d*) in direct competition with existing service, both electric and steam;
   - (*e*) in supplanting steam railroads.
3. Provide service in rural areas.

Urban Transportation

Bus competition in urban areas in direct competition with existing services has occurred in a large number of instances. In most cases, routes slightly different from, but paralleling, the lines of the utility are used. In some instances, however, the busses use the same routes as their competitors, timing trips so as to run a minute or two ahead of the competitors, almost invariably trolleys, and pick up any persons who have gathered at the various stops. It does not seem desirable to discuss this phase of the bus situation in detail. The entrance of the bus into this field has been made possible by the confused legal situation, which, as will be pointed out later, is beginning to clear up. Here, again, the conditions in New York and Chicago are exceptions.

Busses have been utilized to provide service in urban areas not previously served by existing utilities both by those utilities themselves and by independents. While it has not been possible to obtain complete data, or to classify those which are available, it seems likely that as long as such service is confined to a single city or to a metropolitan area served by a single utility, or by a group of utilities centrally controlled, the bus service will be controlled by that utility.

[3] *Aera*, Vol. XIV, 1925, p. 510.

The reason is, of course, that the franchises under which the utilities operate grant them the right to exclusive performance of the transportation function in their territories. In Boston, the Boston Elevated Railway has exclusive rights to street transportation within a radius of approximately six miles of the State House, except the relatively small volume of traffic carried by interurban lines and busses, such as those operated by the Eastern Massachusetts Street Railway Company. In Detroit, Cleveland, Los Angeles, Newark, Akron, Philadelphia, West Chester, and Washington, to mention only a few, the local street railway systems have utilized busses to develop outlying districts.

The conspicuous instances of the development of bus transportation by agencies other than the local street railway utilities occur in New York, Chicago, and St. Louis. In those cities, bus transportation has attained financially its strongest point. The reason is that the franchises granted to the street railway systems in those cities covered streets or routes, rather than areas. In St. Louis, however, the local traction company has also entered the bus field. Because bus companies can reach out into the suburbs more cheaply than can the street railways, the bus companies obtain the business, as it were, by default. The New York situation is somewhat different from the situation in other cities, because of municipal entry into the field. On the whole, the independents probably are as numerous in the field of urban transportation as in any other.

[4] Astoria, Oregon; Emporia, Kansas; Middletown, New York; Streator, Illinois; Rutland, Vermont; Monterey, Pasadena, and Redlands, California—*Bus Transportation*, 1925, Vol. IV, pp. 23, 63. In October, 1925, *Aera* reported 13 other cities in which electric railways had abandoned trolley service and substituted busses. These companies were in Selma, Alabama; Nevada County, Colorado; Joliet, Illinois; Salina, Kansas; Plymouth, Massachusetts; Meridian, Mississippi; Fort Scott, Missouri; Newburgh, Port Jarvis, and Middletown, New York; Toledo, Ohio, (Maumee Valley Railways Co.); Berwick, Pennsylvania; and Brattleboro, Vermont.

Supplanting Trolleys

Substitution of busses for other service, usually trolley service, has been effected, for the most part, by the street railways themselves. A conspicuous example of bus routes which lie wholly in down-town districts is to be found in Boston. In Boston, the trolley route from Rowe's Wharf, the terminus of the harbor ferry and of several boat lines serving residential sections on the South Shore, to the shopping district via South Station was circuitous; service was slow, not only because the route was longer than necessary, but also because the streets were crowded. The streets along the direct route were less crowded but were narrower. Moreover, to build a new line over the direct route would be highly expensive. Because of the difficulties, the trolley service was discontinued. Patrons of the line objected, however, and service was reestablished by a direct bus route. This route has proved one of the most successful of those operated by the Boston Elevated Railway. The new route avoided the South Station, but traffic in that direction was cared for adequately by trolley lines.

The Boston Elevated Railway has substituted busses for trolleys in several instances, usually on light-traffic lines on which track equipment or poles and wire practically were worn out. The Boston Elevated is typical of almost all similar utilities in the larger cities in the United States. At the end of 1924 at least eight small cities were served wholly by bus.[4] In each of these cities

the busses had supplanted the trolley cars.

Probably the most notable instance of the use of busses in urban transportation, auxiliary to trolleys, occurs in Providence, Rhode Island. In Providence, five suburban street railway lines converge at a point a little less than two miles from the terminal at the center of the city. Trolley cars from the suburbs were scheduled to run without stopping, except to discharge passengers, between the point of convergence and the terminal. In practice, however, expresses were held up constantly, especially in peak hours when speed was most necessary, by local trolleys which ran on the same tracks. The street was too narrow to make the laying of a third track practicable, and the construction of turnouts was considered as a temporary solution at best. The utility finally remedied the difficulty by using busses for the local traffic and running all inbound trolleys as expresses stopping only to discharge passengers. This use of the bus seems to have been highly successful; not so much, however, in the matter of cost as in providing a more rapid and convenient service. In numerous other cities busses have been used to relieve congested lines, to make transfers, and to perform other strictly auxiliary functions. This class of service has been rendered, almost without exception, by the utilities themselves.

It is apparent from what has been said that the bus has come to play a large part in urban transportation. In many cases, independents have encroached seriously on the traffic, and, consequently, on the earning power of existing utilities; in a few instances, the independents have assisted the utilities by developing suburban areas which otherwise would be without service. In still other cases, the street railway systems have been able to keep the traffic in their own hands because of adequate franchise protection. There is no evidence that those communities in which the utilities were granted monopolies have been served less well than those communities which independents have been free to enter.

Interurban Transportation

Interurban transportation is used in this article to mean transportation between towns as well as between large cities. It is in the field of interurban transportation that the independent bus companies have been most active. Exact information is not at hand as to the relative importance of the various subclassifications listed above, or as to the relative importance in the field of the independents and the existing utilities. Scattered instances of each use listed under the general heading of interurban transportation have come to the attention of the writer.

It seems likely that the bus has been practically the only means used to establish new interurban connections in the last few years, just as it has been the only means used to extend service to outlying city areas. Because of their cramped financial positions, most interurbans have considered themselves fortunate to be able to care for whatever expansion was required in the areas covered by their franchises. The indications are, then, that in opening up new lines for interurban service and in supplementing existing services the bus has found a sphere of great usefulness.

In their competition with electric lines and steam railroads the busses are meeting with determined resistance. In the first place, the bus is a relatively small taxpayer, whereas the trolley and the steam railroad pay large taxes. This

fact probably will weigh heavily in favor of the established utilities, whether the final fight be carried on before city council, utility regulatory commission, or court. In metropolitan areas the argument is heard that the bus, if used in competition, will upset the rate schedules so that the present cheap "commuters'" ticket will be available no longer, and that, since the bus cannot carry passengers in large masses at peak hours, an increase in the commutation ticket price will tend to make it impossible for large numbers of people to live outside the metropolitan areas in cheaper localities.

The Boston and Maine Railroad relied chiefly on these two arguments in its recent fight against the Boston-Lowell bus route of the Eastern Massachusetts Street Railway before the councils of the cities through which the bus route passed. Several of these councils renewed the bus licenses, declaring that the busses performed a valuable service and one which interfered little with the railroad. Finally, however, the tax argument won over the Cambridge authorities and the discontinuance of the route was forced. The final outcome of this and of similar situations can be discussed better after an examination of the legal features involved in bus transportation and of comparative costs of bus and competing services.

Rural Transportation

Rural areas are defined to include localities not now reached by any utility. The same conditions exist here, and in intensified form, that were found in other fields. Existing utilities which might serve the rural areas have not the financial ability to expand. Moreover, it is doubtful if such expansion would take place, even granting the ability. The automobile has come to be, because of the absence of other facilities, a necessity of rural life. The demand for the service of utilities in rural areas never will be of large proportions; peak demands will be moderate, and relatively infrequent service the rule. To such conditions, obviously, the bus is better suited than is the street railway, for fixed charges would count heavily. It would be logical for busses in such areas to be operated in connection with a public garage and repair shop. The men employed on the bus could be employed in the garage between trips, and labor costs proportionately reduced.

III

Before turning to the legal phases it may be of interest to compare some English experience with that in this country, and to point out some similarities between current developments in the bus situation and the early history of the steam railroads.

The motor bus first was used on a large scale in London, over 15 years ago. The effectiveness and success of motor bus transportation in that city was aided by the exclusion of trams from the main business centers of the city, particularly the city proper and Westminster. True, there was the competition of the tubes; but the ease of access to the motor bus and its widespread extensions into the suburbs made it immediately popular and assured its financial success.

In 1924 the busses of the London General Omnibus Company, which controls by far the larger part of the bus transportation of London, carried 1,214,000,000 out of an aggregate of 3,160,000,000 passengers carried by trams, tubes, and motor busses. Lord

Ashfield, the chairman of the London Underground Railway, of which the London General Omnibus Company is a subsidiary, has explained the popularity of the motor bus as follows:[5]

1. Trams do not come into the central district; the passenger must take either the motor bus or the tube. The bus is more convenient. Both busses and tubes continue into the suburbs in practically all directions; and the riders will not change to the tubes for the sake of a slightly greater speed.

2. The busses come up to the curb. This makes boarding and alighting easy, especially in congested areas.

3. The bus is a new form of transportation. Trams have not changed much in design for 30 years.

4. The tram is primarily the vehicle of the working man. Up to 8 a.m. he rides at half-fare by the Act of Parliament of 1870. Class distinction runs rather high in England. Many people will ride on the bus who would not be seen on the tram.

5. There is a popular impression that busses are faster than trams.

6. A ride in a tram is prosaic; riding on the bus has elements of excitement caused by its dodging in and out of the traffic.

7. The open-top bus is highly popular on fair weather days.

Although extensive use has been made of the bus in handling mass traffic in London, it appears—exact data are not available—that the tube and the tram still are relied upon to handle the peak-load crowds. That is, the bus, even in London, is not able to take care of the greatest concentration of mass traffic. Busses are utilized to carry the greater part of the off-peak traffic.

Other cities of Great Britain seem to have made no systematic attempts to go even as far as London has in the matter of utilizing busses for mass transportation. In Sheffield, Edinburgh, Manchester, Leeds, and other cities, motor busses are used chiefly to serve the lighter traffic routes, to reach out into the suburbs for new traffic, and to handle the off-peak traffic on the main routes.

The uses made of motor busses in England have been determined partly by the limitations in bus capacity and partly by the cost of that method of transportation. In the decade 1910-1920 no British electric railway built a track extension into a thinly populated territory if the railway could secure the right to operate motor busses in the district. Privately owned roads were able to install motor bus routes without much hindrance from regulatory or legislative bodies, but municipally owned roads usually were obliged to secure the permission of Parliament, exactly as in the case of a track extension.[6]

In the United States, as in London, motor bus transportation received its first impetus from the exclusion of rail lines from certain districts. But whereas in London trams were excluded from whole districts, in the United States trolleys were excluded from particular streets. Consequently, large-scale operation of motor busses in the United States was begun first on those streets on which trolleys were not allowed. The most notable instances, of course, are those of the bus traffic on Fifth Avenue and Riverside Drive in New York and on Michigan Avenue and the Midway in Chicago. The relatively small motor bus traffic in New York and

[5] See Report of American Electric Railway Association's Committee on Foreign Operations, *Electric Railway Journal*, 1924, Vol. LXIV, p. 425.

[6] See article by Walter Jackson in *Electric Railway Journal*, Vol. LV, pp. 424-427.

Chicago as compared with that in London probably is largely the result of the difference in the nature of the districts from which trams and trolleys were excluded. For, in London, busses had only tube competition for an appreciable distance; but in New York there were and are trolley and subway lines paralleling, at only short distances, almost all the bus routes; and there is a similar situation in Chicago.

In the most important part of the mass transportation function—that is, the carrying of working men, clerks, and the like to work between 6 a.m. and 9:30 a.m. and toward home from 5 p.m. to 6:30 p.m.—bus transportation in the two largest cities in the United States has done much less even than in London; and, for competitive reasons alone, this probablywas inevitable. Also, it seems likely that bus transportation is unable inherently to cope with the peak-hour traffic.

In comparing bus history with early steam railroad history, it is interesting to notice that there is a distinct similarity between the protests which electric and some steam railroads are making against the bus, and those which were used by the old canal companies in their fight against the railroads. The railroads became alarmed, in turn, at the advent of the electric street railway; but this alarm gradually died out.

Almost without exception, the early railroads in the United States were small local affairs, built from the meager resources of local financiers and entrepreneurs with no thought of traffic beyond that supplied by a narrowly restricted producing area and market. Soon, however, it was discovered that these short links could be connected with advantage; that goods could be distributed over wider markets; and that by the aid of rapid transit, especially if continuous, specialized production could be developed not only in industry, but also in agriculture and husbandry. There followed a period of end-to-end consolidations. Economies in markets and producing areas by no means exhausted the possible savings; large-scale operations were found to result in reductions in operating expenses, and, generally speaking, financial assistance from abroad came to be obtainable on easy terms. The end-to-end consolidations were combined into systems, and, as the movement toward consolidations and trusts became wide-spread, these systems became larger and larger.

In the last five or six years there have been established numerous small local bus lines, many of which connect with each other. A bus map of Indiana recently published looked almost like a railroad map.[7] Are there economies to be effected in bus transportation which will result in end-to-end consolidations at least, and possibly in large systems? A few consolidations already have been attempted. The most notable combination, one which scarcely can be called a consolidation, was the organization of a holding company to control three profitable bus operating properties, one in St. Louis, one in Chicago, and the other in New York. Others of the more important consolidations have been the merger of the bus lines serving Duluth, Minnesota, and the Iron Range; the unified operation of busses around Bakersfield, California; and the consolidation of a number of lines in south-central New York centering around Watertown.

One of the most important single factors which have made possible great economies in large-scale railroad operation in the United States is the large

[7] *Bus Transportation*, Vol. IV, p. 203.

volume of the typical freight movements in this country. Nowhere else can be found such a wide variety of products which move in bulk: coal, oil, iron and other ores, lumber, cotton, naval products, grain of all kinds, live stock, dressed meat, fruits, and vegetables, as well as manufactured products such as machinery, automobiles, farm implements, and furniture. It is difficult to see how the bus or the truck can compete in mass carriage of freight.

The fact that motor vehicles cannot compete with railroads in large-scale traffic in freight, however, does not rule out the possibility of economies in the passenger end, nor does it imply that there are not classes of freight to which transportation by motor is well adapted. Many truck lines from 50 to 100 miles in length, and some much longer, are now in operation. No data whatever are available on this point; but the mere existence of such traffic indicates that there are certain types of goods which may be handled with profit by motor. In some cities, notably New York, congestion at terminals makes the withdrawal of goods from terminals a costly process. The engineers of the New York Port Authority, for example, at the beginning of 1924, calculated that the freight charges on a shipment from Springfield, Massachusetts, to New York City were much less than the cost of removing that shipment from the terminal. Because of this condition, much freight, the volume of which cannot be estimated, now comes into New York by truck. The condition, however, hardly is one which will persist. For carrying goods over long distances, the motor cannot yet compete with steam. But for goods which travel a distance less than 100 miles, upon which quick service is desired, and which may be handled economically in lots of 5 tons or less, it seems likely that motor transportation can be utilized profitably.

The future of bus consolidation can hardly be foretold. Undoubtedly, companies will try to effect savings by combinations. In this connection it is interesting to note that in the early part of 1925 the Association of Bus Operators in Minnesota prepared a consolidated time table for the bus lines of its members. Such a table may lead to making schedules in conference; from joint schedules to combination is a short step. A forecast of the probable success or failure of such combinations requires too extensive analysis to be included in this study.

IV

In the District of Columbia and in every state of the Union except Delaware there is some form of public service commission to control, to a greater or less degree, the operation of companies engaged in the public service. In July, 1923, 42 of these commissions had jurisdiction over privately owned electric light and power companies; 41 over gas companies; 45 over street railways; 37 over water companies; 48 over telephone and telegraph companies. Only 28 of these had jurisdiction over bus operation; and in 5 of the 28 states the authority was slight.[8]

By January 1, 1925, the commissions in only 17 states had no jurisdiction whatever over the operations of independent bus lines; that is, bus lines not operated by public utilities. The 17 states were: Alabama, Arkansas, Delaware, Florida, Idaho, Indiana, Kansas, Louisiana, Massachusetts, Minnesota, Mississippi, Missouri, New Mexico,

[8] From report of a committee of the Investment Bankers Association of America, published by Bonbright and Company, 1925.

North Carolina, South Carolina, Texas, and Wyoming. In 17 states the state commission can exercise no authority over bus lines operating within the limits of municipalities.[9] In Nebraska the commission has exercised authority in only a few cases, and in Tennessee in none; Idaho, Indiana, Kansas, Massachusetts, Minnesota, North Carolina, South Carolina, and Wyoming, since the first of 1925, have enacted legislation creating new or giving existing commissions special regulatory powers.

The chief powers which the state public utility commissions exercise over the companies under their authority are those allowing the commissions to:

1. Grant, refuse to grant, amend, or revoke certificates of public convenience and necessity;
2. Prescribe routes;
3. Fix schedules;
4. Determine character of service and promote the comfort and safety of traveling public;
5. Establish fares and rates;
6. Require reports and uniform methods of accounting;
7. Examine accounts and records;
8. Supervise fiscal affairs such as incorporation and capitalization;
9. Compel additions to, extensions of, or betterments in the physical equipment.

It is difficult to determine to what extent these powers have been exercised in the control of bus transportation. Statutory provisions, together with regulations of the various commissions, specify size, weight, and speed of busses in most of the states; these, however, are in the nature of police regulations, and are rather unimportant for the purposes of this study. An examination of the cases which have come before the courts and public utility commissions will help to determine what functions the commissions are performing as far as bus transportation is concerned, and will indicate whether there exists any well-defined attitude toward bus operation.

By far the greater number of the cases in which busses are involved are concerned with the granting of certificates of convenience and necessity. The basis upon which certificates are granted, and the conditions surrounding such issues, vary widely in different states. In Pennsylvania, the public service commission has used its power to safeguard the rights of existing utilities. For example, the commission held[10] that testimony to show that some classes of freight can be transported more expeditiously and some persons served more conveniently by motor trucks than by electric railways or steam roads is not sufficient evidence that the general public will not suffer by the creation of a competitive automobile service. And again, the Pennsylvania[11] commission refused to authorize motor bus operation in competition with street railway lines, at least one of which probably would be put out of business by the competition, although the bus line would give service directly to the entrance of a hospital located two blocks from the nearest of the trolley lines.

Cases which have been decided in Virginia, New Jersey, Ohio, Iowa, Colorado, Utah, California, Washing-

[9] See Hauer and Scragg, *Bus Operating Practice*, published by the International Motor Company; also *Aera*, Vol. XIII, 1925, p. 1824.

[10] Pennsylvania Public Service Commission: *In re Scott*, P.U.R. (1924) B 208. See also Pennsylvania Public Service Commission: *York Railways Company* v. *Longstreet*, P.U.R. (1924) D 750.

[11] Pennsylvania Public Service Commission: *In re Edwards et al*, P.U.R. (1924) E 661.

ton, and Arizona give evidence that the commissions in those states have the same attitude toward bus operation as has the Pennsylvania commission. In a number of instances those commissions have held that before bus service will be authorized there must be testimony showing that the demand for the service is urgent, that the service supplied by existing utilities is not adequate, and that the proposed bus service will not injure any transportation system already in operation.[12] In California the commission has gone still further; not only does it keep strictly in line with the decisions just cited, but it prescribes the commodities which freight motor lines may carry, requires separate certificates for each route over which busses operate, and sets minimum weight limits for individual shipments.[13] The commission has interpreted the statute requiring certificates of necessity and convenience to include companies engaged in transporting, under contract, the products of associations of producers; but has held also that a municipality need not secure such a certificate in order to operate a common carrier.[14]

The commission in Montana has shown itself opposed to monopolistic transportation service. In the rehearing of the case of a transportation agency which had been deprived of its certificate because of violation of the commission's orders, the commission said in part as follows:

> It is now demonstrated beyond any question that many members of the public intimately concerned with motor vehicle transportation over the route from Billings to Winnett via Roundup are desirous that service by the White Star Line be restored. Additionally, the rehearing has developed the fact not clearly shown heretofore that the White Star Line has operated at a profit, and while its competitor, the Pioneer Line, presents figures showing an operating loss, we do not feel justified in the presence of the public demands in ruling against the carrier which shows its ability to sustain itself, merely to carry out a monopolistic policy.[15]

The evidence does not seem to indicate that the public demand for the White Star Line was more substantial or urgent than was the demand for some of the lines denied certificates in other states. Nor is there any indication, unless failure to show a profit is so construed, that the Pioneer Line was not rendering adequate service. The decision in the rehearing seems to be in conflict with the commission's previous decision on the same case when it was held that one company could and should supply the whole transportation service between two points.

There have been a few bus transportation cases dealing with the returns on investment. In Nevada, for instance, the Public Service Commission ruled,

[12] See Virginia Corporation Commission: *In re Booth*, P.U.R. (1924) C 393; *Reynolds Receiver* v. *Alexandria Motor Bus Line et al*, P.U.R. (1924) E 809; and *in re J. L. Wright*, P.U.R. (1925) B 141; *New Jersey Board of Public Utility Commissioners* v. *Sheldon*, P.U.R. (1924) D 857; *McLain et al* v. *Ohio Public Utilities Commission, et al*, P.U.R. (1924) E 712; Iowa Board of Railroad Commissioners: *In re Moore*, P.U.R. (1924) E 587; Colorado Public Utility Commission: *In re Colorado Motor Bus, Incorporated*, P.U.R. (1924) A 56; *in re Paradox Land and Transport Company*, P.U.R. (1924) E 587; and *in re Gaibon Lewis*, P.U.R. (1925) B 324; Utah Public Utilities Commission: *In re Clark* P.U.R. (1924) A 268, and *in re Blue and Gray Bus Line*, P.U.R. (1924) A 449; also Washington Department of Public Works: *In re Roesli; in re Erickson*, P.U.R. (1924) E 671; and *in re E. J. Miller*, P.U.R. (1925) A 390. Arizona Corporation Commission: *In re International Auto Stage Line*, P.U.R. (1925) A 428.

[13] California Railroad Commission: *In re Hodge Transportation Company*, P.U.R. (1924) D 835.

[14] California Railroad Commission: *White Lines* v. *Freed*, P.U.R. (1924) E 312; and *Colman* v. *City of Montebello et al*, P.U.R. (1924) E 301.

[15] Montana Board of Railroad Commissioners: *In re White Star Line*, P.U.R. (1924) B 193 and 205.

in regard to county licenses, that fees which amounted to 13.3% of the gross earnings of the company, and which when added to taxes and other licenses amounted to 20% of the gross income, were excessive and confiscatory. The commission held at the same time that while in the matter of license fees different treatment might be accorded to common carrier truck and bus line operation than to private operation, such discriminatory treatment must not be confiscatory. The commission ordered modified the ordinances of three counties whose license fees it adjudged excessive and confiscatory.[16] In the District of Columbia the commission granted a motor bus company a rate increase because its fares were not sufficient to enable it to meet the full cost of operation or to earn a "reasonable return on the estimated fair value of its property." [17] The California Railroad Commission, however, has gone so far as to order uniform rates in competitive territory for motor trucks engaged in hauling the same commodity, furniture, over the same routes.[18] Whether this case will be taken as precedent for more extended prescriptions of rates remains to be seen.

Only in California has a state commission exercised authority over security issues. In one case the commission has held that while it has no power to authorize a stock dividend, it may, upon proper showing, authorize the issue of stock to reimburse the company's treasury for earnings invested in the properties. If such an order is made, the company thereafter may distribute the stock as a stock dividend. The same commission has authorized a company to issue stock in order to obtain working capital. At the same time it limited the selling expenses and commission to 15% of the par value of the stock.[19]

A recent decision handed down by the United States Supreme Court in the case of *Buck* v. *Kuykendall* [20] has been regarded in some quarters as an indication of the inability of state commissions adequately to control and regulate bus operation. In this case, the laws of the state of Washington [21] prohibiting the use of state highways by busses transporting passengers for hire over regular routes without certificates from the director of public works, and prohibiting issuance of certificates in territories already adequately served, were held to be in violation of the commerce clause of the United States Constitution, in so far as they prohibited operation of busses between a point in one state and a point in another state over highways constructed with federal aid. A similar decision was handed down in the case of *Bush and Sons Company* v. *Maloy et al.*[22]

On the whole, the cases seem to show that the regulation afforded by the state commissions is sound, that the regulation has tended to curb promiscuous and unrestrained competition, and that the commissions are taking a broad view of the transportation situation instead of considering each case on its own merits only.

It is evident that the commissions

[16] *Ginocchio Bros.* v. *Board of County Commissioners,* P.U.R. (1924) A 302.

[17] District of Columbia Public Utilities Commission: *In re Washington Rapid Transit Company,* P.U.R. (1924) E 321.

[18] California Railroad Commission: *In re Consolidated Furniture Moving Corporation,* P.U.R. (1925) A 202.

[19] California Railroad Commission: *In re Auto Transit Company,* P.U.R. (1925) A 218; and *in re Consolidated Motor Freight Lines, Incorporated,* P.U.R. (1925) B 83.

[20] 45 F (2d) 324.

[21] 1921, p. 341, par. 4.

[22] 45 F (2d) 326.

whose decisions have been recorded have been concerned primarily with the granting, revoking, or amending of certificates of convenience and necessity. The recent decision of the Supreme Court indicates that there are practical limits to which even this function may be performed. Those limits are the same for all interstate transportation utilities, however, and, consequently, competitors of interstate bus routes are not laboring under any special difficulties in this respect. Commissions do not appear to have undertaken to prescribe routes to any great extent. In the Montana case referred to above the commission required, as a condition of granting the certificate, that the bus line file a statement of its routes and schedules with the commission. There was no indication that the commission had specified the routes and schedules. In the same case, one reason for revoking the certificate was the irregularity and inadequacy of the service, and the certificate was regranted on the pledge of the bus line to provide adequate service, run on scheduled time, charge only the rates in the published tariffs,[23] and keep detailed records. The commission did not prescribe rates nor enumerate the accounts to be kept. Only Utah has prescribed uniform accounts for bus lines.[24]

In the cases cited above which were concerned with return, there was no attempt to set out what were the limits between reasonable and confiscatory taxation and no definition of what constituted "reasonable return." With minor exceptions there does not appear to have been any inclination on the part of the commissions to supervise fiscal affairs or to compel addition to, extensions of, or betterments in the physical equipment. To summarize: as far as busses are concerned, the commissions have been much worried over giving permission to individuals, firms, and corporations to enter the business; somewhat less concerned with their profits after they have entered the business; little concerned about fixing schedules, promoting the comfort and safety of the traveling public, or requiring reports and uniform methods of accounting; and concerned not at all with examining accounts and records, scrutinizing fiscal affairs, or compelling changes in the physical equipment of the bus lines.

Taxation

More or less bound up with the legal aspects of the bus situation is the tax question. Of the total amount of taxes paid upon bus operation there is a lack of data. Bus taxation has taken several forms: (1) Capacity taxes which may be (*a*) on capacity as measured by the rated tonnage, or (*b*) on capacity as measured by seats; (2) extra licenses; (3) wheelage taxes; (4) fuel taxes; (5) taxes on gross income. These taxes, of course, are apart from taxes on similar vehicles not engaged in the public service. These ordinary taxes, which the common carrier busses usually must pay in addition to their special taxes, may be licenses based on capacity or rated horse-power. In some states there is a personal property tax based upon assessed valuation.

Thirteen states and the District of Columbia have no special taxes on common carrier busses.[25] Of the taxation

[23] See also Utah Public Utilities Commission, P.U.R. (1925) A 154.

[24] Utah Public Utilities Commission, P.U.R. (1925) A 284.

[25] For a summary of taxation, see Hauer and Scragg, *Bus Operating Practice*, published by International Motor Company, New York. See the same source for summary of functions of public utility and public service commissions.

in the other states, six instances deserve specific mention. Minnesota is the only state using a "wheelage tax." This seems to be a modified form of personal property tax; the rate is 12½% of the manufacturer's list price during the first three years, a 12½% reduction during the fourth and fifth years, and a 50% reduction thereafter. California and South Dakota have taxes based on gross receipts. In the former state the rate is 4%, less the amounts paid in municipal taxes; in the latter a flat rate of 25% is charged. In Washington taxes are not to exceed 1% of the gross receipts and are to defray costs of supervision and regulation. In Virginia and West Virginia the seat tax is regulated by the mileage; that is, the tax is a rate per seat-mile. The rate in Virginia varies from 1/50 cent to 1/20 cent per seat-mile, and in West Virginia from 1/20 cent to 1/10 cent per seat-mile.

In April, 1925, 42 states and the District of Columbia had taxes on motor fuel; only Massachusetts, Rhode Island, New York, New Jersey, Minnesota, and Illinois were not availing themselves of this form of taxation. By this form of taxation, approximately $36,800,000 was collected in 1923 and $79,700,000 in 1924 (or fiscal years nearest to 1924). Of the states which gathered taxes in this manner, 30 applied the total to maintenance of roads, 7 used more than half for that purpose, while 5 and the District of Columbia used less than half. The taxes at present vary from 1 cent to 4 cents per gallon.

One writer [26] recently has maintained that the automotive industry is overtaxed as compared with electric railways and steam railroads. For 1924, he gives $66,500,000 as the tax paid by electric railways, $350,000,000 as that paid by steam railroads, and $555,028,548 as the total tax for the automotive industry. Assuming the correctness of the figures, and there is no statement as to their precise content, it seems obvious that these figures cannot be used as proof that the automotive industry is overtaxed. In the first place, in order to make them comparable, the electric and steam railway taxes should include not only the taxes of the operating companies, but the taxes, or such part as was applicable, paid by that portion of both industries engaged in making rails, cars, locomotives, and so on. But more important is the fact that taxes to the private motor car operator, as well as to the common carrier bus, cover not only that individual's or firm's or corporation's share of the governmental expense and overhead, but stand in lieu of the railroad's—electric or steam—large expense for "maintenance of way and structure." In 1924, for example, five railroads,[27] selected at random, spent approximately 13% of their total railway operating revenue for maintenance of way and structure. This would be somewhat high for a bus operator, since busses do not require complex terminals and expensive stations. Except for South Dakota, however, where the tax rate seems extreme, and possibly California, West Virginia, and Virginia, it does not appear that the bus taxes even remotely approach this figure. It is not likely that more than a small portion of the fuel taxes are paid by bus operators.

Whether or not the bus industry is over- or undertaxed is unsettled. The fundamental question, as yet unanswered, is: Do the busses pay for the wear and tear on the roads attributable

[26] Ritchie, *Bus Transportation*, Vol. IV, p. 163.

[27] Rock Island, Union Pacific, Reading, Erie, and Missouri-Kansas-Texas.

directly to them in addition to their share in the expenses of the government? No way has been found to measure exactly the wear and tear caused by busses. In examining operating costs it will be well to remember that there is the possibility, in some states, that taxes on busses, along with other motor vehicles, may be increased.

V

Operating cost data are unavailable except for a mere handful of companies, most of which also operate electric railways. Despite the scarcity of information this study would be only half complete without an analysis of costs. Like any other rapidly growing industry, the bus industry is experiencing rapid changes in the standards of equipment. Heavy charges for obsolescence, therefore, are inevitable; the amount of such charges can be little more than a matter of guesswork. Again, the charges for depreciation, because of the inexperience of motor bus companies, cannot be reckoned on a sound basis. Since the public highways serve as the roadbed, such portion of taxes on them as go for road maintenance is logically a part of bus operating expenses.

It will be well to start off with a per-mile comparison of the operating revenues and expenses of street railways and motor busses based on figures published in the February, 1925, *Aera*. Table III gives these figures.

Operating expenses per passenger per car mile of the 80 electric railway systems were 5.37 cents, while the operating expenses per passenger per bus mile of the 45 bus systems were 6.96 cents. The average capacity of the busses operated by the 45 systems was 24.24 persons. The operating expenses per seat per bus mile, therefore, were 0.948 cents. If the average seating capacity of the street cars of the 80 reporting companies was 35, and doubtless the actual figure would exceed that, the operating expenses per seat per car mile will be lower than those per seat per bus mile. The revenues cannot be compared since the busses presumably were used in light traffic or auxiliary service. Studies made by the statistician of the American Electric Railway Association indicate that bus costs were reduced in 1924 as compared with 1923. This was attributed to the perfecting of the bus organization, and a general improvement in operating efficiency.[28]

In the course of collecting cases for the course in public utility management at the Harvard Business School, the Harvard Bureau of Business Research has collected some data on bus operating costs. These data are incorporated in a series of cases as yet unpublished. Because the data, in most instances, were given to the Bureau with the understanding that the source was not to be revealed, it can only be said that figures for Cases 1 to 7 were obtained in New England, and those for Case 8 in a southern city. Some New York and London figures are added for comparison, see Table IV.

Probably the most striking feature of the bus costs in Table IV is the wide difference between the costs for the various companies. Practically the

TABLE III. REVENUE AND OPERATING EXPENSES FOR 1924 BASED ON 80 ELECTRIC RAILWAYS AND 45 BUS SYSTEMS OPERATED BY RAILWAYS

Item	Per Car Mile	Per Bus Mile
Revenue	$0.449	$0.221
Operating expense	0.331	0 230
Net revenue	0.118	0.009*
Taxes	0.013	0.009
Passengers, number of.	6.16	3.3

*Deficit.

[28] *Aera*, Vol. XIV, 1925, p. 157.

TABLE IV. COMPARATIVE OPERATING EXPENSES, TAXES AND FIXED CHARGES, AND REVENUE OF BUSSES AND STREET RAILWAYS IN THE SAME LOCALITY

Data from Unpublished Cases in the Files of the Harvard Bureau of Business Research

CASES	PER BUS MILE		PER CAR MILE	
	Expenses	Revenue	Expenses	Revenue
Case 1	$0.372	.....	{$0.286*	.....
Case 2	{0.4202	.....	{0.466	.....
	{0.3471	$0.3678		
Case 3	0.4595	0.3449	.....	$0.55
Case 4	0.2504	.....	.....	.....
Case 5	.....	.....	.....	0.28
Case 6	0.2406	.....	.....	0.54
Case 7	0.245	.....	.....	0.329
Case 8				
Line A	0.2351	.....		0.2568
Line D	0.2350	0.175		0.1215
Line E	0.2428	0.250		.....
Average A, D, E	0.2366	0.211	0.2383	0.228
London	0.3763	0.4091	0.2815	0.3313
Fifth Ave.	.....	.....	.....	.....
Motor Coach.	0.4053	0.5625	.....	.....

*Figure low because the roadbed was almost entirely worn out The investment, therefore, was small and the interest low. To replace the track would have brought the operating expenses more nearly in line.

whole of these differences came in depreciation and tire expense. Where these differences do not appear in aggregate amounts charged for these items, they are revealed in per-mile costs by reason of variations in the annual mileage. For example, in Case 2 the annual mileage per bus was approximately 20,000, while in Case 4 it was 74,460. In Case 2, however, the addition of a bus line was estimated to cut the per-mile cost to $0.3471. This appears to be a reasonable figure for New England. Estimates of expense under $0.30 seem to be too low. The word "estimate" is used even in data for actual operation, because the charges for obsolescence and depreciation must of necessity be in the nature of estimates.

The trend of the decisions of executives in the cases collected by the Harvard Bureau is worthy of consideration. These decisions indicate what the figures themselves do not bring out clearly, namely, that per-mile bus operating costs, including adequate allowance for depreciation and taxes and fixed charges, are slightly lower than per-mile car costs; the decisions have been to operate busses over light traffic lines where relatively long headways are consistent with adequate service. The decisions indicate further that bus costs per seat per mile are higher than street railway costs per seat per mile; there have been relatively few decisions to institute service on heavy traffic lines except for off-peak hours or as auxiliary to trolleys. This seems to agree fairly well with the experience in London.

The Bureau has not had opportunity to make an intensive study of the bus industry as a whole. The figures cannot be said to be typical of the greater part of the industry, although they may be. They give, at any rate, a fairly accurate picture of costs in New England.

VI

Viewing the situation as a whole, we have a picture of an industry carrying on an enormous volume of business, spread over the whole of the United States, and rapidly becoming an important cog in our transportation machinery. Within moderate distances, not over 100 miles, attempts have been made to use busses for virtually every service performed by other modes of transportation. Legal restraints and safeguards are not so numerous nor so rigid as they have become in other industries engaged in the public service. The state legislatures, however, are rapidly making provisions for the regulation of busses, and while those commissions which have had jurisdiction have paid most attention to the problem of granting certificates of convenience and necessity, there are indications that the commissions are beginning to consider rates and returns; doubtless supervision of service, routes,

schedules, accounts, and fiscal affairs will follow. Taxes on bus operation seem to be light as compared to the probable wear and tear on roads caused by that method of transportation. There is no adequate standard by which to judge this point, however. Bus costs, as compared with those of electric railways, and the decisions of bus operators indicate that busses are more useful than electric street cars on light traffic lines or in auxiliary service and that they are less serviceable on heavy traffic lines or at peak hours. The bus, therefore, is the logical means of transportation for a large number of people who otherwise must depend on vehicles owned by themselves. The bus has found a successful use as a unit in itself in New York, Chicago, and possibly St. Louis. In other cities it is taking the place of outlying trolleys whose roadbeds must be thoroughly renewed to keep in operation; and an extensive use is and will continue to be the development of newly built-up suburban areas.

As to the permanent place of the bus, little can be said at the present time. The courts and utility regulatory bodies will decide in some measure what that place is to be; tax policies of state legislatures will have an important bearing; inventions will play a part. It will be well, in passing judgment on the bus situation, to keep in mind the development of railroads in this country. It must be remembered that for a long period in their early history railroads not only were undertaxed as compared with other industries, but also that they were the recipients of huge land grants and other assistance from the government. In thinking of the progress of bus regulation, we must recall that railroad legislation hardly began to be adequate until after the railroads had been in existence 50 years. Railroad regulation is more involved than bus regulation, of course, since the railroad is primarily an agent for interstate transportation, whereas bus lines are predominantly intrastate. But there is little ground for despair in the current legal problems of the bus industry.

In the process of change which will take place until the parts of our transportation mechanism come to an equilibrium, two other factors must be recognized. The first of these is the influence of air transportation. Efforts at regular transportation by air have been spasmodic so far, but it is well within the range of possibility that a change in our modes of transportation more revolutionary by far than anything which the bus can effect will be brought about by air machines in the not far-distant future.

The second factor to be considered was suggested recently by Judge George W. Anderson, of Boston.[29] Judge Anderson pointed out that the fundamental distinction between rail and motor transportation is the fact that the locomotive of the former steers automatically, whereas the locomotive of the latter must have the constant attention of the driver, who must not only steer, but must also stop and start the vehicle and, in some cases, collect fares. ". . . . we are undertaking to move on non-steering highways, whose course, and not merely speed, is dependent upon human intelligence, alertness, and action. In essence, the problem is insoluble. Almost as soon as locomotives began to run on the rail highways, monopoly control was, for safety's sake, given to the operating companies. The public use was prohibited; to walk on the rail highway is to trespass, not because it is private property, for it is not, but in order to

[29] *Atlantic Monthly*, 1925, Vol. 135, p. 393.

prevent accidents. We cannot exclude pedestrians from our streets."

The roads are becoming more and more crowded; the dangers of accident are becoming greater and greater; public opinion may not tolerate an agency of transportation which tends to increase the dangers of daily life. On the other hand, it may be that extended use of busses will tend to decrease the number of private automobiles in use and thus relieve highway congestion.

This study indicates an imperative need for intensive study of the problems connected with the bus industry; the progress of the industry is of vital concern to railways, both steam and electric, to regulatory bodies, to legislatures, and to the great body of citizens, as taxpayers and as users of transportation facilities. More complete data as to the size of the industry, including mileage operated, passengers carried, and capital invested; operating statistics such as the railroads furnish the Interstate Commerce Commission; and information as to costs are needed. Only by careful study of such factors can the bus be assigned to its proper place without excessive waste of energy.

INSURANCE PROBLEMS OF THE BUSINESS EXECUTIVE

By AVARD L. BISHOP

I

IN those halcyon days when all business units were still small, when population had not yet become congested, when real estate values were still comparatively low, and when, in general, industry and trade had not passed beyond their more elementary stages of development, there was no real insurance problem for the business executive to handle. The relatively small and simply built plant, if a manufacturing concern was the type of business unit in question, was covered by a few thousand dollars of fire insurance; the equipment and the stock of raw materials and of goods in their various stages of manufacture also were covered, in all probability, for a few thousand more. After 1866, organizations that used a steam boiler might have a steam boiler insurance policy, for in that year (1866) this type of coverage was offered by a Hartford, Connecticut, company. This was about all the insurance a typical manufacturing business unit would carry; for other types of business enterprises than manufacturing concerns, fire insurance was likely to constitute the only kind of coverage.

It was more than likely that the insurance was placed through the town lawyer who, perchance, might be glad enough to supplement his professional income by acting as local agent for a few insurance companies with which he placed practically all the various classes of local insurance risks. The policies were renewed by him when they were about to expire, and everything relating to insurance matters, excepting the adjustment of losses, was entrusted by the heads of the various business enterprises in the town to their personal friend, the lawyer, in his capacity as an insurance representative. In certain factory towns, especially in the textile-manufacturing regions of New England, independence of the stock fire insurance companies was sought by certain groups of manufacturers as manifested by the formation under their own management of factory mutual insurance companies. The system is said to have originated as early as 1835, and was founded upon the idea that fire losses should be prevented rather than be distributed. Excepting in certain local regions, however, the bulk of the insurance business of the industrial enterprises continued to be placed with stock companies somewhat in accordance with the manner outlined above.

II

Here in America, in striking contrast with the conservatism that characterizes practically everything human in many countries of the Old World, our methods of industry and of trade—our productive and distributive processes—are ever continuing to change. Such development has given rise and still continues to give rise to new, and previously unthought-of, problems as simplicity of organization and operation have given way to greater complexity. These problems touch many different fields of business such as organization, finance,

administration, and the like. They have been much talked of and copiously written about by competent authorities to the great advantage of those who have to cope with such problems. Furthermore, we should not wish to minimize the importance of these particular problems by directing attention here to those arising in a field which hitherto has received relatively little attention. We refer to the field of insurance. With that great movement toward large business units that started in the eighties of last century to replace many of the smaller units in the same or related fields, with the growth and congestion of population, with the rapid rise in real estate values and of prices in general, with the uncertainties and hazards that arise from the present-day complex system of production and distribution, the insurance problems confronting the modern business executive are, at times, of considerable moment.

A few examples may help to give this theoretical contention a more practical bearing. In these days of larger business operations than those of a half-century or more ago, the increased size of the plant and its equipment, the larger and more valuable stock that is carried, and the appreciation of real estate values have combined to necessitate the carrying of many times the amount of fire insurance formerly carried. Again, the change from the system of production-to-order to one of production-in-advance-of-orders and on a relatively large scale has resulted in giving the manufacturing organization a large overhead which must be carried, regardless of whether or not the plant is in continuous operation. It is, therefore, highly undesirable that the work of the plant should be interfered with for any cause whatsoever. Now, if a fire occurs and business is thereby interrupted, the ordinary standard fire policy does not undertake to indemnify the insured against loss resulting from interruption of business. The physical plant will be restored or replaced, but this may take weeks or months. In the meantime, profits have to be sacrificed on goods that might have been produced, had the fire not occurred, and overhead costs have to be borne during the whole waiting period. It is to cover just these situations that the use and occupancy indorsement was devised. Whether or not this particular type of coverage shall be secured to supplement the ordinary fire policy by any concern in question has to be decided by somebody, and a wrong decision may prove to be very costly to the organization.

Again, the use of machinery always has been accompanied by danger from accident. Before the recent era of workmen's compensation legislation, the employer, under certain conditions, might be held liable for accidents which occurred in his organization while, under other conditions, he was regarded as blameless. The first policy for liability insurance was not written in this country till 1886 and, after that date, some employers shifted their liability to employees in case of accident to an insurer, although a very large proportion continued to carry the risk themselves. This state of affairs continued until the second decade of the present century, when a movement for workmen's compensation, regardless of the conditions or the cause of the accident, soon resulted in the necessary legislation being passed in practically every state. Accordingly, workmen's compensation laws have very largely replaced employers' liability under the common law, so that hundreds of thousands of business units must now provide for workmen's compensation coverage as

required by the state in question. In many cases, it is optional for the business concern to provide this type of coverage or that, but some one has to make the decision as to just how the company shall provide the necessary protection.

Still again, group insurance, especially among certain of the larger types of corporations, is rapidly becoming the vogue. It dates only from about 1911, but it has had a remarkable growth in the 14 years of its existence. Certain executives have to decide whether or not group insurance shall be provided for the employees of their particular companies, and under what conditions or on what terms the coverage shall be placed. Again, the phenomenal development of the motor car within the last two decades has given rise to a considerable group of entirely new and, at times, costly hazards. This necessitates various kinds of automobile insurance for the fleet of delivery trucks and service cars that the company has come to own. Shall this be placed in stock or in mutual companies? Shall collision insurance be bought? What shall be the limit of the public liability coverage? These questions must be answered and more answers than one are to be found. Again, shall any of the risks, those of fire, for example, be placed with reciprocals, or shall they be avoided? It is unnecessary further to multiply instances. Dozens of other hazards, perhaps, are confronting the managers of the business at every turn, calling for decisions to be made by some one in authority as to whether the risk in question will personally be assumed by the corporation or shifted, for a consideration, to an insurance company. Largely within a decade or two, with the change from simplicity to complexity in organization and operation of industry and trade, these and a great many other questions of a similar nature have arisen, and they have combined to make a real man-sized insurance problem for some one or more of the executive officers or committees of tens of thousands of our business units.

What is the best line of policy for a company to adopt in order to provide for the efficient handling of its insurance problems? Where it is felt that the insurance already is well handled, there is no problem bothering the executives, and what we have to say here would have no application. It is the writer's opinion, however, reenforced by more or less practical experience, that this question is the source of considerable concern to a great many business managers who have determined upon a policy of efficiency at every point. There is no formula that can be prescribed whose use will answer the question proposed; moreover, any particular business unit may be surrounded by certain local conditions which might very well affect materially the handling of its insurance affairs. Nevertheless, there are certain possible plans for handling the insurance of a business concern, that may be outlined, some one of which is pretty likely either to fit the requirements of a particular business or to be capable of adaptation to its requirements. The main features of these alternative plans will now be presented in order.

III

In the first place, there are a few of the larger corporations of a special type that have cut loose from the insurance companies, in whole or in part, and have undertaken themselves to assume certain of the risks involved in their operations. Such action implies self-insurance. Where such a practice has

been resorted to, let us say with respect to the fire hazard, it is usually found that the business unit in question is carrying on an enterprise which is pretty well adapted, in this particular regard, to the self-insurance plan. For example, a large manufacturing or marketing concern might have a good many individual plants of fairly uniform value, distributed geographically over a considerable area, and with no special or unusual fire hazard at any one of these plants. If the number of such plants (or buildings) was sufficiently large, a decision of the corporation to carry its own fire risk on them would not necessarily be unwise.

Those who have carefully studied and written upon the question of self-insurance and whose opinions are worthy of respect have laid down certain basic conditions, which we may here mention, for a reasonably safe use of this plan. Thus, there should be a considerable number of units of property involved, but just what that number should be is subject to conflicting opinions. Surely the minimum should be in the neighborhood of 50, although a still larger number would seem to be safer. In any event, the number should be large enough for the law of average to apply. Again, the units of property involved also should be pretty fairly uniform in value for the proper application of the same law. Furthermore, it seems to be customary for conservative self-insurers to carry the risk themselves only on the less valuable items, in case some are considerably more valuable than others, and to carry insurance with a regular insurance company on the more valuable units. Sometimes the self-insurer carries his own risk on each unit of property only up to a certain conservative amount, and then regularly insures the excess value of all items beyond this figure. In either case, the motive prompting such action is the fear that a substantial loss would either totally exhaust or make too big a hole in the self-insurance fund. Certain large shipping concerns are reported to have resorted to self-insurance on their vessels somewhat along the lines outlined above and, apparently, the plan has worked satisfactorily.

Before concluding our discussion of this first plan for handling the insurance problems of a business enterprise, it should be stated in passing that there is only an insignificant number of the more than two million business units in the United States that could safely resort to self-insurance. The great majority of these enterprises are still comparatively small and would for that reason alone be disqualified. Of the larger flight of enterprises, only those that could meet the conditions specified above could safely embark upon the plan. If a business organization decides, however, that it is able to meet the necessary requirements for self-insurance for certain of its risks, and that it will launch a plan of self-insurance for their coverage, it should do so gradually. This should be contemporaneous with, or, better still, only after, the accumulation of a substantial insurance fund of its own. The change from all company insurance to all self-insurance in a single week or even in a single year would be highly venturesome.

IV

A second possible plan for handling the insurance interests of a business enterprise, though one which to us would seem to have little in it to recommend itself to the business community, is to form a subsidiary corporation to carry on a general insurance and real estate

business. All of the capital stock of the subsidiary would be owned by the business enterprise in question which could, therefore, entirely control its policy. All of the insurance of the parent company—fire, automobile, public liability, workmen's compensation, and so on—would be placed through the subsidiary. The latter would be paid the regular premiums such as normally would be paid to any insurance agency, without any deductions whatsoever. The subsidiary would transact a regular insurance and real estate business, serving all-comers alike. Its net profits would be paid out as dividends on its capital stock and would, therefore, be turned over to the parent company.

This plan is subject to very serious disadvantages and would not, in all probability, be an advisable one for most industrial and commercial enterprises to adopt. In the first place, the insurance business is highly technical in character as well as extremely competitive; and, for its successful prosecution, nowadays, it requires a personnel of both high-grade and properly trained specialists. These would have to be recruited mainly from among the insurance agencies and brokerage firms, and much would depend upon their proper selection. The success of the subsidiary could not be taken for granted. For most industrial and commercial concerns, it would likely prove to be better business, in the long run, not to try to push themselves into an unknown field of enterprise, already well occupied by efficient organizations, but to "tend to their own knitting." It would be very easy to drop a stitch or two and ruin the whole layout. By dissipating their energies in embarking upon what to them would be a secondary line of work, a wrecking of the main line of business might easily be the ultimate result. Again, there are many types of business enterprises that are peculiarly dependent for their success upon the good-will of the community. There would be serious danger, therefore, that the present good-will of a business concern might very seriously be impaired, if not entirely lost, when it became generally known that the subsidiary corporation, though ostensibly an independent insurance and real estate organization, was nothing more nor less than a device created by a manufacturing or commercial business unit primarily for the purpose of saving the commissions on the insurance which it carries. For the rank and file of the country's business units, the subsidiary-corporation plan would seem to us to contain little to recommend itself.

V

We come now to a third plan which, in striking contrast with either of the two already presented, should make a wide appeal. The plan contemplates that the managers of the business organization in question should carefully select a high-grade insurance agency or brokerage house, having one or more men at the top in whom they (the managers) have the utmost confidence, and take up with such house, in a preliminary way, the question of the company's insurance problems. If the preliminary conferences are satisfactory, and if it then seems advisable to proceed further in the matter, an arrangement could easily be made to have a competent representative of the brokerage house make a painstaking analysis of all the policy contracts now in effect, in all the various fields in which the business concern already carries insurance. This is a type of service which insurance organizations are coming to perform for their clients. The chances are it will be found that the

business is not systematically placed, but that several agencies or brokers have come to share the insurance business as the business unit in question has increased in size. It also will be found, perhaps, that the amount of insurance of certain kinds that is carried is entirely inadequate for present-day conditions, that some types that should be carried are not carried at all, and that other defects in the insurance coverage will be brought to light. Of course, there are exceptions, for it is not to be taken for granted, by any means, that all business units are inefficient in handling their insurance interests.

If after a consideration of the results of this analysis it becomes even more apparent than ever that something must be done to handle the insurance problems more adequately than they have been handled, and if the managers of the business concern in question still have confidence in the ability of the heads of the selected insurance organization properly to handle their insurance problems, they are ready for the third and last step in the proceedings. An arrangement might then be concluded with the insurance house whereby, if it will agree adequately and efficiently to look after the insurance business of the concern under consideration, the latter will proceed to take such steps, as soon as it is feasible, as will ultimately result in placing on the books of the selected insurance house practically all of the insurance business of the concern in question. It would not only be expected but actually agreed that the insurance house would secure for its new client the lowest premium rates that were consistent with safety on all types of insurance; that it would see that the business concern was duly complying with the terms of the co-insurance clauses in all policies containing them, and with all other clauses which often are a pitfall to those who violate them because of failure to understand them; that it would recommend improvements or installations from time to time so that the concern in question might receive the benefit of still lower premium rates; and that, in various other ways, the interest of the new client would be kept constantly in mind and duly safeguarded. In consideration of this service on the part of the insurance house, the proper executive officer or officers of the business concern would agree that when its present policies of insurance should expire, the insurance house with which it has now made an agreement to handle its insurance business should replace them by others in the companies with which they had established connections, so that within a year or two, the insurance house in question actually would be handling and receiving a commission on close to 100% of the insurance business of its new client.

This third plan can be recommended almost unreservedly. In all probability, it would constitute the best possible arrangement for by far the greater proportion of business concerns that are sufficiently bothered by vexing insurance problems, to feel the necessity of seeking outside aid for their solution. The only possible drawback to the plan —a drawback which is more potential than actual, and one which probably would not actually materialize very often—is that it is almost too much to expect an outside business concern, depending upon the commissions earned in its transactions for other people for its income, to decide always in favor of the most economical policy for a client when a somewhat different, but no better, policy would yield larger commissions on the transaction. It is perfectly natural to find self-interest coloring

business transactions, and this trait is well-recognized as an impelling motive in the business world. As a matter of fact, however, we have known personally of a considerable number of cases where insurance agents and brokers have recommended to their clients lines of action which meant a considerable sacrifice of commissions which they might easily have had. We believe that this is a common occurrence among high-grade insurance organizations. We mention what seems to us to be a possible drawback to plan three, therefore, with reservation, for it is not serious enough to be considered, provided proper care is exercised by the business organization in selecting the insurance firm.

VI

A fourth possible plan for a business enterprise to follow in the solution of its insurance problems is for the executive officer or committee to whom has been assigned the making of all decisions involving matters of insurance to seek out an expert—one versed both in the theory and in the practice of the insurance business, and having an appreciation of the important function of insurance in the modern world of business—and consult him from time to time as vexing questions arise. This plan has two very important advantages. In the first place, it is entirely in line with modern business practice in other respects, in that it enlists expert service in time of need. The lawyer's advice is continually being sought by business enterprises, and economists are coming more and more into demand by business concerns for advice on questions involving economic theory and economic policy. In the same way, insurance experts should be in demand, and they are being sought out by business houses for advice on their insurance problems, usually with highly satisfactory results. In the second place, the practice of consulting the insurance expert has an advantage over the third plan listed above, in that he has no connections with any company, insurance agency, or firm. This means that his judgment on this question or that is entirely uncolored by any chance of present or future gain. Furthermore, if he is of the proper caliber, he can view, in all probability, the insurance problems of the average business concern in a broader perspective and with less bias than can the officers of the concern themselves. For these reasons, the plan of consulting an insurance expert has a compelling appeal, and it has yielded good results to various concerns that have given it a trial.

The fifth and last plan to be considered here is one which is still in its infancy, although it is a plan which, in our opinion, is full of promise. In fact, it already is being tried out by some organizations, and it is under serious consideration in other quarters. It consists, in brief, of a decision on the part of the management of the business organization in question to have an insurance man of its own. If the concern is a large one, attending to its insurance problems may absorb the full time of its insurance expert; but if, on the other hand, the concern is smaller, other interests than insurance can very well occupy part of the time of the employee in question. Lest we may be misunderstood in this matter, it should be mentioned at once that this so-called insurance man is *not* to serve the management in the capacity of an insurance agent or broker. Far from it. It is expected, however, if he proves to be the right man for the job, that he will develop, in time, so as to be the insurance expert of his organization. In this capacity, he will handle

the insurance problems of the business unit in question, either directly or through recommendations to the management, and will place its insurance through recognized agencies in the best interests of his employers.

Such a young man is not to be picked up every day. He should already have a considerable background of insurance theory, and should know something also of its practice. If he has had a grounding in the law, particularly in contracts, and is familiar with the principles of corporation finance and allied subjects, and has a knowledge of business procedure, so much the better. Much, of course, depends upon the inherent qualities of the young man chosen; but, if the choice has been wisely made, he should soon develop into a highly useful member of the organization, relieving the management from those troublesome insurance problems which owe their origin to the manifold risks arising from the complexity of organization and operation of modern business units.

THE FRENCH COTTON INDUSTRY AFTER THE WAR

By N. W. POSTHUMUS

SINCE the war, the French cotton industry has been confronted with two problems. First, how can France in the long run become independent of the foreign markets for her supply of raw cotton? Second, will it be possible for the French cotton industry to develop into a modern export industry? There is, therefore, one problem concerning the raw material and another concerning the final product. The solution of the first problem is a question of the future, but the second demands full attention at the present time.

Dependence of France on Foreign Cotton Production

During the past few years a continuous effort has been made in France to secure a territory which will be able to produce cotton needed for French industry. At present, 99% of the cotton consumed is imported from foreign countries, the greater part from the United States, which is, of course, the greatest of the world's cotton producers. Of the whole American production, which in the year 1923-1924 was 11,248,000 bales (as stated in the *Annual Cotton Hand-book*), 633,000 went to France. France, therefore, can be considered a good customer of the United States. Because she is so dependent on American production, France, like other countries, is compelled to accept the prices fixed in the United States. For various reasons she is now making a great effort to become independent of that supply. Furthermore, in the United States, a tendency to use the cotton produced for domestic manufacture is to be observed. The American cotton industry is growing and more cotton is being consumed; this, therefore, is a sign of the still greater industrialization of that country. Consequently, less cotton is available for export, and the prices show a strong speculative element. Besides, the cotton production shows a tendency to diminish, owing to other special and economic changes now taking place in the United States. All these factors contribute to an appreciable decrease in the export to France of raw material, which is further enhanced by monetary difficulties as a result of the depreciation of the franc. In 1917, 75% of the cotton import into France came from the United States; in 1923, only 62%. France has to reckon seriously with the possibility of a very great diminution of the American export, a possibility which actually rather appeals to the French industrial. Just now this diminution is met by a corresponding growth of the import from the two other countries which are important for the cotton supply of France: British India and Egypt. Statistics of the years 1917 and 1923 show the following movement of the import:

	1917	1923
India	9%	16%
Egypt	7.5%	13%

In other words, although less was imported from America, a greater amount was imported from the two territories

just mentioned. But both are working principally for British and British-colonial markets and will continue to do so in the future.

All these complications have driven France to look for the solution of these difficulties in an entirely different quarter; namely, to get hold of a territory suitable for cotton culture. She, therefore, turned to her own colonies; a society was founded for this purpose, the "Association Cotonière Coloniale" (Colonial Cotton Association), which has, since 1903, made very careful investigations as to the possibilities of growing in the French colonies those kinds of cotton most needed by the French industry, and those kinds equal to the American (Louisiana) and the Egyptian (Jumel) cotton. A sustained effort has been made to obtain favorable results from cotton culture in North-Africa, West-Africa, and Oceania. French Indo-China does not come into consideration here; it constitutes a special case, since the cotton grown there with success is mostly consumed by Japan and the local industry, owing to the fact that it is of a quality which makes it unfit for the French market. Not only in the older African colonies, Algeria, Tunis, and Morocco, is this culture now to be found, but very good results are expected from French West-Africa, the territories in Senegal, those on the Niger, the Gold Coast, and Dahomey. Numerous experiments have been made more recently under the direction of an American, Dr. Forbes. These researches have proved that it is possible to produce successfully cotton both of the Egyptian and the American types. The preparations are now so far advanced that the basis is laid for regular production. These results have been partly retarded by the fact that the natives had to get accustomed to this new method of culture. However, in the greater part of French Africa the population was growing cotton for its own use; here it was sufficient to provide the people with selected seeds to improve the quality and production and to pay them adequately for their labor. In the French-African colonies great tracts of land are still available for this culture, and there are sufficient laborers to work them. The difficulties of transportation will be met partly by the development of the railways in French West-Africa.

As is seen, the conditions for future success are present. The French are highly satisfied that it has been proved possible to grow not only Egyptian, but also American cotton, and great expectations are fostered as to the future importance of these results.

The following statistics show, however, that not more than a beginning has been made.

There was imported in France from the French colonies in bales of 225 Kg. in the years:

	1921	1922	1923
From			
Algeria		630	478
Senegal		74	549
Indo-China ...	6,784	1,190	916
Other colonies.		9,129	7,120

That the production of Senegal is increasing is clearly shown, but the numbers taken absolutely are as yet of small importance. Even in the French protectorates the same effect has been made; for instance, in Syria, where, however, the lack of labor and means of communication is a serious handicap. Here we may refer to the very prudent words of General Messimy in his report for the "Commission of the Colonies of the Senate" in 1924. "Nous sommes encore," he says, "au stage de naissance d'un petit enfant qui tente de faire ses

premiers pas, ou de prononcer en balbutiant ses premières paroles." [1]

But if we remember how rapid the development of the cotton culture was in Egypt and the British Sudan, once efficient methods and irrigation on a large scale were applied, the probability may be admitted that the French colonies will be able to furnish an important part of the cotton needed in France, and this in a not very distant future. For the next few years, however, the American supremacy in this matter will be still unchallenged.

The French Cotton Industry

The cotton industry in France has now almost recovered from the damages caused by the enemy during the war, especially in the northern districts. However, some of these damages have been exaggerated; namely, those reported in Alsace. In a very short time this industry will have the same equipment at its disposal as before the war.

In 1924 there were in use in France (without Alsace-Lorraine) 9,006,300 spindles, 143,500 mechanical looms, and 112 machines for printing on cotton. To this Alsace-Lorraine adds 1,879,900 spindles, 43,800 looms, and 156 printing machines—that is to say, an increase of 20% in the number of spindles, 30% in the number of looms, and almost 140% in the number of printing machines. These numbers clearly show the great importance to the French cotton industry of the return of Alsace-Lorraine to France. It has greatly improved the power of this industry, but the French industrials have also felt the great increase of competition in the home market.

[1] "We are still in the stage of a small child that tries to make its first steps and to stammer its first sentences."

Even before the war lack of harmony was seen in France between cotton spinning manufacturers and cotton weaving establishments, these two branches not being under the same management, as is still the case in other countries. In some parts of France the number of spinners exceeds the number of weavers and in other parts the contrary may be observed.

The home market was entirely reserved for the French spinners, as the so-called Méline tariff, in force since 1892, excluded any serious competition. As a result the spinners have been orientated almost exclusively at the internal market, which makes this branch extremely sensitive; as soon as prices are good, the number of spindles increases rapidly, causing overproduction and consequently a fall in prices. The introduction of the eight-hour day has had the effect of almost eliminating this danger of overproduction. On the other hand, as a result of the high price of cotton, caused by the great British and American demand, the spinners can hardly work with profit in the long run. Socially their position shows up unfavorably with other lands; the larger size of the factories has made possible there a greater specialization with a corresponding diminution of the cost price. The French spinners find themselves obliged to spin a great number of yarns in all sorts of cotton and sometimes in small quantities, as their clients may desire. The weaving establishments show this same feature. They produce many more kinds of material than, for instance, the British factories. Runs are short and changes of designs on looms frequent, which means loss of time and a greater need for skilled laborers, causing an increase in the cost price. This disadvantage is partly met by the fact that they can benefit from the low

price of thread. The position of the French spinners has been favorably affected by the coming on the market of the Alsatian industry, as in that country the weavers use more thread than the local spinners can produce. This has done much to establish a better balance between spinners and weavers.

French Export of Cotton Goods

In the French export of woven stuffs the colonial market should be distinguished from the strictly foreign market. In general the French export trade has successfully recovered its pre-war position; even in the colonies a progress may be registered. Taking the absolute numbers of the French export trade, one will find them still below the pre-war figures. This is explained by the fact that the introduction of the eight-hour day has diminished the production in general, and consequently also the export trade. If one takes this into consideration, an ascending line may be traced in the French export curve. In France the industrials as a rule are convinced that the colonies will still offer great future outlets, expecting in this way to make up for the losses in the markets of the former enemy. The small purchasing power of the native population limits these possibilities, but the bringing into culture of a greater part of the colonies by the French themselves has a stimulating effect. The natives can buy French materials out of the increasing returns from colonial products. The introduction of the cotton culture favors, therefore, the final consumption of the goods. Once more it is shown that a close relation exists between import and export, and that favoring the former means enlarging the latter.

All this is further facilitated by the French colonial tariff system. The French exports go principally to Algeria, the oldest colony, and Indo-China. There the population has, for the most part, ceased to use the coarse native materials. The markets of Tunis, Morocco, and French West-Africa may still be greatly enlarged.

Nevertheless, the French have serious rivals in their own colonies. The cause of this may be traced to the general feature of French production; that of too little specialization. In this matter the British production shows a distinct superiority. Frequently the French article is too little adapted to the demand of the natives to be able to meet foreign competition. The French industrials have now awakened to this fact, and are seriously trying to improve in this respect. An effort has been made to produce on a large scale staple articles especially suited for the consumption of the colonial population. The realization of the need for this change has come only since the war, but already the effect can be clearly seen in the following statistics of British importations into the French colonies. On account of the fluctuation of the franc in the last years, the weight is given instead of the value. The English import trade is still important in Tunis, Morocco, Senegal, Guinea, Dahomey, Indo-China, but on the whole it is diminishing as is shown by the import of cotton goods from England.

Importations into Tunis declined from 1,753,000 Kg. in 1922 to 546,000 Kg. in 1923 (—63%);

Importations into Morocco, from 5,947,000 Kg. in 1922 to 4,871,000 Kg. in 1923 (—18%);

Importations into Indo-China, from 654,000 Kg. in 1922 to 560,000 Kg. in 1923 (—14.5%);

Importations into Martinique, from 236,

000 meters in 1922 to 164,000 meters in 1923 (—30.5%).

One might group the French colonies as follows:

1. Those colonies where foreign importing has almost disappeared, the materials consumed being almost exclusively French (Algeria).
2. Those where the foreign competition is strongly diminishing, while the French imports show a corresponding increase. (Morocco, Madagascar, Indo-China, Martinique).
3. Finally, those where the foreign production evidently responds better to the native demand, and so shows an increase (French West-Africa).

Besides England, Japan and the British colonies import cotton stuffs in Indo-China; and in French West-Africa, Holland has obtained a foothold. The English competition would never have lost so much of its force, had not the cost of production in England after the war shown such a strong increase, thus greatly facilitating the French rival trade. Just now it is impossible to say how far this factor is temporary. The United States has only in Guadeloupe and in Martinique an import trade of any importance, and this trade also is diminishing—in Guadeloupe, from 50,000 Kg. in 1921 to 30,000 Kg. in 1922; and in Martinique, from 130,000 meters in 1921 to 73,000 in 1922.

Generally speaking, the French should be satisfied with the latest developments. They will certainly succeed in crushing foreign competition in a not very distant future, with the exception of a few special cases, and provided, of course, that they continue to apply modern methods of production. Up to now their colonial commercial policy has lent a helping hand; the allowing of long credit can be another means to win their colonies as customers. Besides, it ought to be remembered that the progress of foreign competition in some parts has been due not to economic causes, but to special political factors, for instance, the loosening of the tie between France and her colonies during the war.

As is seen, the colonial market is of growing importance for France, although the same cannot be said of the foreign market. Before the war the foreign market consumed about two-thirds of the total exports, while now the two markets each receive half. The exports to the older clients of France —England, Belgium, and the United States—have not varied importantly during the last 10 years. Now, if one remembers that this export trade consists principally of articles of a better quality, it is clearly seen that the French cotton industry was not, and is not yet, a real export industry. Up to the present the French have concentrated their attention on the internal and on the colonial markets—the rather high prices of their goods have prevented them from getting the supremacy of any of the great export markets of the world, such as the industry of England, Germany, and the United States has established. One gets the impression that only the surplus of the production goes abroad, which particularly has been and still is a feature of the French industry in general.

Besides this, a number of facts have had an unfavorable influence on the French export trade. First is the growing popularity of protectionism among modern states. Apart from Holland and perhaps England, no country has remained an adherent of the principle of free trade. This has limited the international market, but equally for all the competing states. There are a few considerations, however, which count only for France and which have hindered a further expansion of the export

trade. As has been stated, the French production does not bring on the market staple articles, but only those of a better quality. The French have specialized in things of good taste, well finished, and of original design; every year a great number of novelties are launched. From one point of view, these qualities offer as many weak points as strong ones for conquering the export market. Such a conquest must be made, in the first place, by cheap goods; smartness does not count. Further, ignorance of the demand of the foreign market; the relative indifference of the French industrial for export trade, which prevailed until quite recently; the high cost of conquering a new market; the industrial centers being, as a rule, a long way off from the sea; and the high shipping rates, all have their influence. Finally, the wages exercise a certain pressure. It seems that the temporary shortage of hands has disappeared in the French cotton industry, but the French laborer is unwilling to work as intensively as, for instance, the English. While in England a weaver has several looms to work on, from 8 to 12, and in America sometimes a still greater number, the French weavers have repeatedly refused to work on more than 2 looms. It is also remarkable that the French statistics, to take only the number of weavers, show an average of 0.7 laborer per loom. During the war, this condition was somewhat improved. Since the war, more progress has been made toward greater efficiency.

Resuming, the French cotton industry, in order to develop into a real export trade, must make the following improvements:

1. Fabrication of staple articles and specialization;
2. More efficient work from their laborers;
3. Production on a larger scale;
4. Allowing of long credits for the sale of their articles;
5. A closer contact between the producing and the consuming country, by getting a better knowledge of the habits and the wants of that country.

The founding of an export bank would certainly have a stimulating effect. However, new customers have lately been found in the newly formed states in the east of Europe—Poland, Czechoslovakia, the Balkans, and also in Italy—and in general France is working very hard to increase the number of her new relationships.

The Problem of Alsace

The joining of Alsace to France gave rise to two questions: what is the situation of the cotton industry in Alsace after being cut off from her former markets? And how does the French internal market react on receiving this additional merchandise?

It must be remembered that the industrial establishments in Alsace have suffered relatively little from the devastations of the war; all the plants are again working at full production. This has made the loss of their old markets all the more severe for the Alsatian industrials. The Treaty of Versailles gave a provisional arrangement for the first five years, starting on January 10, 1920, and expiring on January 11, 1925. This agreement allowed the Alsatian industrials to import their goods into Germany free of all duties. This has greatly helped them to get over the first and most difficult post-war period. The export to Germany was for the years 1920, 1921 (8 months), and 1922 in thousands of metrical quintals, respectively 54, 153, and 139.

Then, however, a factor unprovided for by the treaty made itself felt. Af-

ter the occupation of the Ruhr a tacit boycott by the Germans of all goods of French origin caused a serious decrease in the French import trade. The total export of French cotton goods to Germany was reduced to 39,000 M. Q. in 1923.

When the provisionary arrangement for the first five years expired, France did not ask for an extension, although the Versailles Treaty gave her the right to do so, under the supervision of the League of Nations. The reasons for this abstinence were several: first, the fact that such an extension was of little value as long as the unwillingness of the German buyers lasted, and second, the French Government was convinced that this demand would not have been granted, as England would have objected. The Alsatians insisted, but without success.

After January, 1925, the very high German duties practically cut off the Alsatian industry from the German markets. Besides, the Alsatians had lost, since their return to France, the foreign markets which they had possessed indirectly through the reestablished German importing houses. Not knowing much themselves of these foreign relations, they had to work very hard to regain at least a part of them.

Contrary to the expectations of many, these numerous difficulties have not led to a crisis on the French internal cotton market. This may be accounted for by several factors. The Alsatians have succeeded in getting back a good part of the markets which they had through the German importing houses. Then, too, Germany has remained a customer, although only for goods of a fine quality, which can bear the present high duties. Old pre-war relations with France have been revived, and, finally, the Alsatians have not remained idle during the five years in which they could freely import into Germany. Foreseeing that this free import trade would cease, they tried to establish in the meanwhile new foreign relations, in which they were not without success. So they are exporting. When asked where to, the answer of the Alsatian industrial is: "Everywhere—to the colonies, to the old foreign markets and to the new ones, to Germany also," particularly unbleached cotton, because bleached stuffs are forbidden, a measure taken to favor the German chemical trade. The new tariff of August 17, 1925, has continued this protective policy. Finally, the Alsatians compete on the French market, but not everything which goes inland stays in France. A rather remarkable way of exporting cotton stuffs is via the great French houses of fashion and the warehouses, partly as material and more often as finished dresses. So only a part of the Alsatian production for France comes really on the French market, and apparently the latter can support this addition, for no complaints are heard. Again, the diminishing of production because of the eight-hour day has its effect. Furthermore, 1924 has been a very good year for the industrial, a fact which has helped him over many a difficulty. And perhaps complaints are not uttered just now, because they would not have a favorable effect on the negotiations with the Germans on the new commercial treaty.

The French Government desires to get the treatment of the most favored nation, although the French law forbids this clause in any French treaty of commerce. However, the French, and more especially the Alsatian, industrial does not expect much of this, for even if France succeeds in getting this clause inserted in the treaty, it would not have much importance, because England

would also get this most favored treatment. Any favor shown to the French cotton industry would also count for the British. So the cotton industrials do not expect much from this commercial treaty. In the meantime they work and search everywhere for new export possibilities, which are facilitated by the depreciation of the franc. The experts in this matter do not expect a crisis through the addition of Alsace to France. Only a monetary change, a too rapid deflation of the franc would, in their opinion, have such an effect. It is certainly a most remarkable fact that the very profound changes called forth by the Treaty of Versailles have not, to all appearances, brought about a condition in the French cotton industry approaching a crisis.

SOME STREET RAILWAY REORGANIZATIONS[1]

By A. V. WOODWORTH

WHEN Lawrence Chamberlain published his *Principles of Bond Investment* in 1911, street railway securities were the premier investment. Today the street railway is probably the deadest of investment questions. But many investors who still have street railway securities tucked away in the back of their tin boxes are beginning to ask if, by any chance, a period of revival for these securities may be in sight.

There has recently been a great change in the attitude of the public and the Public Service Commissions toward an increased fare. A start has been made toward regulating the motor-bus competition. The street railways, since the war, have been through a drastic financial reorganization. Have these things been enough to start them on the road to recovery? Studies have been made elsewhere of other phases of the question. This is simply an attempt to make some investigation of the subject of street railway reorganizations.

The story of how the street railway rose to investment favor, and how it supplanted, for the time being, the steam railway is an interesting bit of financial history. Beginning with the study of the steam railway we find that the public first started buying these securities in the forties and fifties. But the great rush of stock exchange speculation began after the Civil War, and though checked by the panic of '73 and the decline of '84, continued almost unabated until the nineties. During this period railroad bonds were the safe investment and railroad stocks the speculative opportunity of the moneyed public. When the crash came it was found that the chief causes of failure were overcapitalization, overexpansion, and competition of other lines. Many of these had been built for stock exchange purposes or because they might possess a nuisance value or because they must occupy some new and undeveloped territory before a rival should build into it. In 1887 the Interstate Commerce Commission was formed largely to handle the matter of rates. But the more important evil of overcapitalization was left to be corrected as it might be by the reorganization committees of the nineties. These had plenty to do. Between 1893 and 1899 an imposing group of American railways went into receivership. "In 1893 alone more than 27,000 miles, with an aggregate capitalization of almost $2,000,000,000, were taken over by the courts, and in the following years the amount was largely increased."[2] As the total miles in operation in 1893 were 173,000, it meant that in that year alone more than 15% of the total mileage of the country passed into the hands of receivers.

Most of the reorganizations were completed by 1899. But by that time the public had become pretty thoroughly disgusted with railroad investments and the investment bankers were looking for fresh fields to conquer. The industrial as an investment had not yet appeared

[1] The statistical material used in this article was collected by John C. Kingman, a student in the Graduate School of Business Administration, Harvard University.

[2] Daggett, *Railroad Reorganization*—Preface.

above the horizon. The electric railway arrived at the psychological moment.

I

Today practically all street railways are electric. But as late as 1888 there were only 150 miles of electric railway in existence in the country. By 1902 this had increased to 16,000. In those days about all that was needed was to get a franchise. The early street railway had always been a strictly local matter operating usually within municipal limits. State interference by a regulatory commission was hardly thought of and did not begin in earnest until New York created its Public Service Commission in 1907. It was during this period, and up to the beginning of the Great War (1914) that the fortunes were made in street railways. Also during this period the foundation was laid for some of the future disasters. The old horse-car was a simple and comparatively inexpensive affair. But in quite a number of large cities it was superseded, in the late seventies or early eighties, by the cable-car. This was a complicated mechanism with central power-house and general high cost of construction. Within the next 10 or 15 years this all had to be scrapped to make way for the electric. But there was no way by which this could be amortized, and it was consequently carried on the books as so much dead capital on which the new electric system had to make earnings. That, however, was only one of the excuses for overcapitalization. Following the example of the steam railroads they had, on general principles, overcapitalized many of the good roads, and had built many "streaks of rust" across sparsely settled territory whose chief excuse for being was that the securities could be sold to an unsuspecting public.

The street railways suffered somewhat from the general depression of 1912-1913. But the real trouble began with the depreciation of the value of the dollar after the beginning of the war. The cost of supplies advanced. Presently labor demanded constantly increasing wages. But the 5-cent fare on the street railway had become a fixed obsession in the public mind, and could not, without an explosion, be changed.

For a few years after 1914 the street railways kept on expanding by their own momentum. During the decade from 1907-1916 they showed an average annual extension of 960 miles. But already their most dangerous rival, the automobile, was gaining by leaps and bounds. The jitney competition played havoc with earnings even before the motor bus. The figures show that in the six years from 1919-1924 (inclusive) there was a net average decline of 140 miles per year in electric railways. During this same period one authority states that 91 roads totally abandoned service.[3]

[3] An attempt was made to see what return, if any, the investor received from the roads which were abandoned. Very meager figures were found in the sources consulted. (*Commercial and Financial Chronicle, Moody's* and *Poor's Manuals,* and *The Electric Railway Journal.*) In all, the scrap value of 20 roads was found. A total mileage of 528 sold for $1,479,563. This is, roughly, $2,800 per mile. Except for the Shore Line Electric Railway (Norwich, Connecticut), which sold for $6,800 in 1920, the highest and the lowest prices recorded were received for the Sandusky, Norwalk and Mansfield Electric Railway in 1920 and in 1924. This railway had the unique distinction of being sold for scrap twice within a four-year period. The first purchaser paid $5,380 per mile in 1920 for the 32.50 miles of road. He was so enamoured of his purchase that he decided to operate the road rather than scrap it. The success of the venture may be seen by a comparison with the price at the second scrap sale which occurred in 1924. The price then recorded a drop from the earlier price of $5,380 to $1,655 per mile.

These six years also mark a period of drastic financial reorganization. The receivership statistics for the period 1919-1924 show the year 1920 as the high point in the number of roads in the hands of receivers (10.95% of the total). Two years later, 1922, showed the greatest percentage of miles of road in receivership (11.75%).

Table I seems to indicate that for the moment, at least, the pressure of reorganization and receivership is over. Either as a result of combination or abandonment, the total number of roads in operation has shrunk from 841 in 1919, to 769 in 1924. The number of roads in the hands of receivers has dropped from 91 to 63; and the percentage of roads in receivers' hands, from 10.95 to 8.20. The percentage showed a slight rise in 1924, but this was due to the sudden drop in total roads. Fifty-two roads disappeared between 1923 and 1924. The probable explanation of this may be that a group of receiverships happened to be all working themselves out at the same time. In the two years from 1922 to 1924 the total miles in receivership dropped from 5,551 to 3,670. The percentage of miles, however, showed a smaller decline—from 11.75 to 7.83. This was due to the steady drop in the total miles of road in operation. This fell from 47,941 to 46,837 miles, a loss of 1,104 miles between 1919 and 1924.

The capitalization involved in receivership during this period showed a much greater proportional shrinkage than either the number of roads or the mileage. In 1919 the stock involved in receivership was $263,852,224 and the bonds, $456,097,317, a total of $719,949,541. In 1924 the amounts had shrunk to $131,793,085 for the stock and $244,858,677 for the bonds, a total of $376,651,762. In other words, nearly half the total capitalization which had been in receivership since 1919 was now cleared.

II

The swing of the cycle of these receiverships and their obvious tendency at the moment to diminish rapidly suggests, at first sight, some analogy to the period of steam railroad reconstruction in the nineties. One may go a step farther and say that the causes of failure leading to this reconstruction were in many respects similar. They may be summarized as overcapitalization, overexpansion, and competition.

1. Overcapitalization was one of the chief financial characteristics of the railroad construction period. The steam railroads exercised no self-restraint in the issue of securities until after the reconstruction period of the nineties. The electric railways followed much the same

[4] Table of figures from *Electric Railway Journal* —Review of receivership statistics in January issue each year.

TABLE I. RECEIVERSHIP STATISTICS OF STREET RAILWAYS [4]

Year	Total Roads	Roads in Receivership	Percentage of Roads in Receivership	Percentage of Miles in Receivership	Miles in Receivership	Total Miles
1919.....	841	84	9.98	9.99	4,791	47,941
1920.....	831	91	10.95	11.17	5,330	47,705
1921.....	838	90	10.74	11.45	5,449	47,555
1922.....	827	85	10.28	11.75	5,551	47,150
1923.....	821	63	7.67	8.49	4,008	47,283
1924.....	769	63	8.20	7.83	3,670	46,837

course, though in a somewhat modified degree, until the state regulatory bodies began to exert some pressure beginning with the creation of the New York Public Service Commission in 1907. In both groups common stock was created almost at will, with very little regard to security behind it. But the greater financial weakness centered about excessive bond issues. In those days the investing public would buy almost anything that was called a bond. The result was that much too large a proportion of the capitalization was made up of bond issues which carried the inevitable fixed charges against earnings whether the earnings were made or not. The percentage of bonds to total securities of the steam railroads in 1913, long after the reconstruction period of the nineties, was 56%. Many regarded this as an excessive proportion. But this same year 13 steam roads in the hands of receivers, with a total of over 16,000 miles, showed over 70% of their capitalization represented by funded debt. The street railways under receivership from 1919 to 1924 showed nearly as bad a condition. Here the ratio of bonds was 65%. When one realizes that this excessive proportion of bonds is measured against a still more unjustifiable amount of stock, it can hardly be wondered at that the roads ran into financial difficulties.

2. Overexpansion was pretty much the same sort of thing in both types of railway. The desire to "beat some competitor to it," the mixture with land promotion schemes, the curious psychological urge to be the head of a bigger system than any one else, all these played their part. Behind it all was the banker hunting for salable securities and the sharper who was always ready to promote an enterprise which must be bought out at its nuisance value.

3. Excessive competition played its part in wrecking both types of railroads. But the quality of competition is so different in the electric railways from that in the steam railways that the analogy between the two conditions breaks down completely at this point. In the steam railways the competition, in the large, has been between one steam road and another. It is only recently that the motor bus and the truck have begun to interfere seriously with the steam railroad. The general method in the past of overcoming their problem of competition has been for the steam roads to combine or consolidate. But the competition which the electric roads have had to face has been of a quite different quality. They have competed directly against each other only in rare cases. Their monopoly remained practically unbroken until the advent of the automobile and the jitney, and more recently of the motor bus. No amount of financial reorganization would meet the difficulties involved in such a problem.

It is evident, therefore, that the street railways, in spite of the apparent parallel of their history with that of the steam railways, are really in a different situation today from that of the steam railways in 1899. The chief problem which the steam roads faced then was that of financial reorganization due largely to overcapitalization. The street railways have had to face the unwillingness of the public to allow an advance of fare, and accompanying this the sudden outside competition first of the jitney and then of the motor bus.

The motor bus competition is so new that even the courts are still in doubt as to the standing of this new public service vehicle. The legislatures of the Middle West, however, are showing an increasing willingness to grant to the Public Service Commissions very con-

siderable powers of regulation. One interesting form of this is along the line of the Kansas law that no motor bus line may be established "unless the public convenience and necessity will be promoted by such operation." If the commissions will interpret this ruling to mean that when an existing street-car line is already in operation a competing bus line may not be established even though it begins operating by offering lower fares, then the street railways will have one of their most serious difficulties behind them.

III

With a view to discovering what happens to security holders in street railway reorganizations, a detailed study was made of a group of reorganizations extending from 1900 to 1924. In all 96 companies were taken from those reorganizations recorded in the files of the *Commercial and Financial Chronicle, Moody's* and *Poor's Manuals,* and *The Electric Railway Journal.* No attempt was made to hand-pick the companies, but many were necessarily excluded because of incomplete data. A few owned subsidiary companies, which explains certain variations in the statistics. A later analysis suggested no basis for either a chronological or a geographical differentiation. It is true that on May 31, 1919, 87.2% of all the street railways in Connecticut [5] were in the hands of receivers. But this may be reckoned as part of the aftermath of the Mellen régime rather than an indication that the electric railway situation is more unsound in Connecticut than in any other part of the country. It may also be said that more than 50% of the companies included in the study of reorganizations came from the four states of New York, Pennsylvania, Ohio, and Illinois.

The types of securities were so diversified that it seemed advisable to divide them into six groups:

1. First mortgages on the entire system, hereafter called "first mortgages";
2. First mortgages on parts of the system usually issued by companies since absorbed or consolidated, hereafter called "subsidiary mortgages";
3. Second, refunding, general, and all otherwise designated junior mortgages or debentures, hereafter called "junior mortgages";
4. Preferred stocks of all kinds;
5. Common stocks of all kinds;
6. Receivers' certificates.

The companies were studied in respect to the relative position before and after reorganization as to (*a*) the amount of principal, (*b*) rank of security, and (*c*) the rate of interest received before and after reorganization.

1. First mortgage bonds were issued by 67 of the companies included in this special study. An attempt has been made to summarize the treatment which these first mortgage bondholders received. Table II shows, in the first column, whether the old bondholder received an increase in the amount of principal, the same principal, or a decreased amount of principal. In the second column it shows how many received security of a higher rank, how many the same, and how many security of lower rank. The third column treats the question of the rate of interest in the same way. The columns are to be read up and down. There was such variety of treatment under each group that any form of graphic presentation seemed too complicated to be really satisfactory.

[5] *Proceedings of Federal Electric Railway Commission,* 1919, p. 2181.

TABLE II. NUMBER OF GROUPS[6] OF FIRST MORTGAGE BONDHOLDERS AFFECTED BY REORGANIZATIONS

	Amount of Principal	Rank of Security	Rate of Interest
Increase	23	0	12
Same	34	27	24
Decrease	10	40	31
	67	67	67

For example, in the first column, of the 23 that received an increase in the amount of principal, 11 received the increased principal but in security of a lower rank and carrying a lower rate of interest. Five received increased principal, the same security, and the same interest. This represents a real gain under the process of reorganization for all but one of the five. This one had to pay an assessment. Four other companies gave increased principal in securities of a lower rank, with the same rate of interest. One of these also was assessed. Two gave increased principal, the same security, and increased interest. One which received increased principal received reduced security and the same interest. The variations can be studied in the detailed analysis given in the footnote at the foot of this column. There are still further variations which are not brought out in this detailed table. For example, one of these first mortgage bonds received in reorganization 50% of new first mortgage bonds, 50% of debentures, and 50% of common stock. That, however, was in the early days before the Public Service Commission. The company had struggled with a deficit for three or four years, and foreseeing that its patience was soon to be rewarded by large profits apparently reorganized on a basis which would forestall any public criticism as to the distribution of the anticipated income.

On the other side is the company which ranks in this same group as having received an increase of principal, but gave its former first mortgage bondholders 20% preferred stock and 100% common. The roughest treatment accorded to any first mortgage bondholders was by the company that gave in reorganization 10% of preferred and 45% of common stock after payment of a 10% assessment.

An interesting comparison may be made with the treatment accorded to first mortgage bondholders in the Atchison reorganization in 1895—a typical railroad reorganization of that period. There the first mortgage bondholders had to accept 75% new first mortgage bonds and 40% income bonds in place of the old first mortgage bonds. The second mortgage bondholders were given an equal amount of preferred stock and paid in addition a 4% assessment.

2. Analysis of the subsidiary mortgages—that is, first mortgage on parts of systems—shows that they were not as well treated as the holders of first mortgage bonds on entire systems (Group 1). On the whole, it seems as though the underlying mortgage on street railways was less valuable than

[6] A detailed analysis of the chart giving summary of treatment of first mortgage bondholders shows that 67 groups of first mortgage bondholders were treated as follows:

2 cases increased principal: same security: increased interest
5 cases increased principal: same security: same interest*
4 cases increased principal: reduced security: same interest*
1 case increased principal: reduced security: same interest
11 cases increased principal: reduced security: reduced interest*
3 cases same principal: same security: increased interest
12 cases same principal: same security: same interest
2 cases same principal: same security: reduced interest
3 cases same principal: reduced security: increased interest
3 cases same principal: reduced security: same interest
11 cases same principal: reduced security: reduced interest
3 cases reduced principal: same security: same interest
7 cases reduced principal: reduced security: reduced interest

67

*One paid assessment.

TABLE III. NUMBER OF GROUPS[7] OF FIRST MORTGAGE BONDHOLDERS OF SUBSIDIARIES AFFECTED BY REORGANIZATIONS

	Amount of Principal	Rank of Security	Rate of Interest
Increase	16	0	32
Same	80	32	40
Decrease	7	71	31
	103	103	103

the corresponding security on the steam railroads.

It is to be noted that while all but seven of the holders of these 108 subsidiary mortgages received the same or an increased principal, more than 70% received securities of a reduced rank.

The lines of demarcation here are somewhat clearer than in the case of the first mortgage bonds. The most frequent plan in this group is to give the same principal with an inferior security and about the same average rate. Out of 103 subsidiary mortgages considered (5 were eliminated) 25 were undisturbed. Of the 16 that received an increase of principal, 9 received securities of reduced value but an increase of interest rate; 5 received reduced security and reduced interest rate; 2 received the same security and the same interest. Of the 80 that received the same principal, 22 received reduced security and reduced interest; 15 received reduced security and increased interest; 13 received reduced security and the same interest; 5 received the same security and increased interest. The 25 which were undisturbed fall in this group. Of the 7 which received decreased principal each was given 100% preferred stock. Five subsidiary bonds were paid in cash. Five were entirely eliminated.

3. Junior bonds were found in 46 cases. Naturally they did not fare as well in reorganization as securities of a higher type.

Of the 4 that received increase of principal, 3 received reduced security and reduced interest and one of these was assessed. The remaining one received the same security with reduced interest. Of the 25 that received the same principal, 10 received reduced security and reduced interest; 7 were undisturbed; 5 received reduced security but increased interest. Of the remaining 3, one received increased security, 1 the same, and 1 a reduction. Two received the same interest and 1 an

TABLE IV. NUMBER OF GROUPS[8] OF JUNIOR BONDHOLDERS AFFECTED BY REORGANIZATIONS

	Amount of Principal	Rank of Security	Rate of Interest
Increase	4	1	9
Same	25	9	10
Decrease	14	33	24
	43	43	43

[7] A detailed analysis shows that 108 groups of holders of subsidiary mortgages were treated as follows:

2 increased principal: same security: same interest
9 increased principal: reduced security: increased interest
5 increased principal: reduced security: reduced interest
5 same principal: same security: increased interest
25 same principal: same security: same interest
15 same principal: reduced security: increased interest
13 same principal: reduced security: same interest
22 same principal: reduced security: reduced interest
3 reduced principal: reduced security: increased interest
4 reduced principal: reduced security: reduced interest
5 Eliminated
108

[8] A detailed analysis shows that 46 groups of holders of junior mortgages were treated as follows:

1 increased principal: same security: reduced interest
3 increased principal: reduced security: reduced interest
1 same principal: increased security: same interest
1 same principal: same security: increased interest
7 same principal: same security: same interest
1 same principal: reduced security: same interest
5 same principal: reduced security: increased interest
10 same principal: reduced security: reduced interest
3 reduced principal: reduced security: increased interest
1 reduced principal: reduced security: same interest
10 reduced principal: reduced security: reduced interest
3 Eliminated
46

increase. Of the 14 that received reduced principal all received reduced security: 10 received reduced interest, 3 an increase, and 1 the same. A reduction of the rank of security which is shown in 33 of these cases means that they received either common or preferred stock in place of their former bonds. Of the 43 cases considered (3 were entirely eliminated) 1 was paid in cash.

4. Preferred stocks were found in 41 of the special companies analyzed. Of these 15 were entirely eliminated; 13 received common stock in place of their preferred; 5 were undisturbed; 4 received an increase of principal with various changes; 4 received the same principal with reduced security and reduced interest. In only 5 cases was the preferred stock assessed. No attempt was made to analyze the preferred stocks in relation to the special provisions which governed them. But in view of the growing tendency since 1910 to lay more and more emphasis on these special features, it is interesting to see that nearly 70% of the preferred stock was either eliminated or received common stock in the reorganizations.

5. Common stocks received the usual scant consideration which is given to the owners of a property in receivership. Out of 102 cases (a few of these were subsidiary companies) the common stock was entirely eliminated in 49, or nearly 50%. Of the 53 companies in which the common participated in the new plans, 31 received a less amount of stock; 8 received less than 50% of new common; 3 leased subsidiaries received bonds of the parent company. Ten were assessed, one up to 100%.

6. Receivers' certificates occurred in 7 of the reorganizations studied. Of these 6 were paid in cash. In the remaining case all of the certificates were owned by the parent company which accepted junior bonds in exchange.

IV

The changes in capitalization of the 96 companies here discussed in detail do not show the same excess of bonds over stock which is indicated by the more comprehensive list, given earlier, of all companies under reorganization from 1919 to 1924. One reason for this is the more inclusive nature of the earlier list. Another reason is the inclusion in the special list of some large companies which, like the Chicago Railways, had outstanding extremely large issues of stock. The capitalization of the companies included in the special study consisted before the reorganizations of 50.9% funded debt, 9.3% preferred stock, and 39.8% common stock. After reorganizations, the capitalization was made up of 44.3% bonds, 22.8% preferred stock, and 32.9% common stock. In summary the figures for the old and new capitalizations are shown in Table V.

The changes here indicated follow what might be called normal lines. There has been a determined effort to reduce fixed charges indicated by the shrinkage in the proportion of bonds. This has been made up, so far as need be, by issues of preferred stocks which are still eagerly absorbed by the investing public. The shrinkage in the total capitalization is a healthy sign of a wish

TABLE V. CHANGES IN CAPITALIZATION DUE TO REORGANIZATION

	Old	New	Ratio of New to Old
Bonds	408,941,212	344,160,038	68.8%
Preferred Stock	91,392,605	176,267,529	192.8
Common Stock	390,674,123	254,309,027	65.1
Total	981,007,940	774,736,594	78.9
Interest on Bonds	25,444,563	18,029,790	70.8
Average rate of interest	5.099	5.253	Inc. 0.153%

on the part of the reorganization committees to do the job thoroughly. With only 44% in bonds, and with the total capitalization much reduced, it would seem as though these companies were, financially at least, ready for a successful start. There has been, too, a pretty general increase in fares granted by the Public Service Commissions. It is too soon to tell whether these increases have been enough to meet the financial needs; but the great body of people in the large cities must ride, and the traffic density in most places will not allow the general substitution of busses. For these urban companies it is merely a question of when the Public Service Commissions and the public will realize the rights of invested capital and sanction high enough fares to yield a proper income on an uninflated capitalization.

A detailed discussion of what is a proper fare would involve an analysis separating street railways in cities from suburban and interurban lines. This is beyond the limits of this paper. In addition, the problem of jitney and motor bus competition must be faced. It is too soon to give a definite answer, but at the moment the outlook suggests that the railways may end by owning the bus lines.

There is, however, one delicate problem which arises if this last statement should prove prophetic. How can the public or the Public Service Commissions be persuaded to pay a return on the capitalization of the displaced street railway and also on the bus which displaces it? In an industry which is expanding rapidly, property abandoned through obsolescence usually represents only a small percentage of the total investment, and it may be perfectly good accounting practice to charge this off out of earnings. But when the obsolescence occurs in a street railway the conditions are quite different. For many years the earnings of the railways have been kept down so low by the five-cent fare that they have had no opportunity to build up special reserves for contingencies, even if they wished to do so. Now they are faced with the necessity of scrapping much perfectly usable material because it must be replaced by the busses. In some cases this replacement will run as high as 50% or even 75% of the total investment. They will be in competition with some newly formed company seeking a franchise and having no arrears on which earnings must be paid. Such a company can, at least at the start, offer a lower fare than the old company struggling to pay interest on discarded material. The Public Service Commissions may be persuaded that the failure to accumulate sufficient reserves is due to the regulated fare and not to lack of foresight on the company's part. But it would still remain an open question whether this decision would meet with the approval of the people, who constitute in such cases the court of last resort.

THE EXPERIMENTAL EVALUATION OF A MERCHANDISING UNIT

By MAX FREYD

THE experimental method has its place in industry no less than in the laboratory. It is the most accurate way we have for isolating variables and discovering their exact influence. There is every reason for maintaining the same standards of accuracy in figures for the guidance of business executives as for the guidance of laboratory workers. If the same standards are not maintained, we have an anomalous situation: The supposedly impractical college research worker comes to conclusions only after careful collection and sound analysis of figures, while the practical business man makes decisions involving large sums of money with biased and unreliable data for his guidance.

There are many problems in advertising and marketing which can be solved by the experimental method. Sometimes, of course, the answer to the problem is to be found in careful analysis of the records of the firm. But often these records are the result of such a mélange of forces that it is difficult to tease out the influence of any one of them. The desired facts can then only be discovered by repeating the process from which the records sprung, with such modifications of practice as will allow the influence of but one variable at a time to be felt.

To illustrate how this method may be applied to a merchandising problem, let us consider the retailer's window display.

For the national advertiser the retail store window is a medium comparable with newspapers and magazines. Copy and production are taken care of by the advertiser, and the material is sent to the medium—the retail store—to be inserted in the advertising pages—the windows.

If a product is distributed in great quantities at a very low price, the selling burden must be carried almost entirely by advertising, since the returns on one unit of the product are not sufficient to justify a great amount of personal selling. Under these circumstances the advertising copy is of two sorts: a lengthy and educative type in well-produced magazines which are read at leisure, and a brief and reminding type in window trims and counter displays.

The function of the manufacturer's window trim is essentially to remind the consumer of the existence and need for the product at a moment when it is very convenient for him to purchase it. It is perhaps this function as a mere reminder that underlies the neglect of it in contrast with other mediums. When an advertiser makes up his lists for a national campaign, he selects his newspapers and magazines with great care. He defines his market as accurately as he can with regard to geographical location, economic status, and sex. He studies the reading habits of his prospective consumers and places his message where they will be likely to see it and be influenced by it. When placing his window trims, however, he does not often use the same care. If the distribution of his product is very extensive, he is likely to install his display indis-

criminately in all stores accepting it, with entire disregard of his economic loss.

The determination of the value of a window display and the method of employing it most effectively is a good illustration of a problem in advertising and marketing which can be solved in the field by the experimental method. A study of this sort can be carried out at no great expense, but it calls for scientific training and persistence of a very high order in gathering the data. It places in the hands of the sales executive a body of facts which are not selected with a view to flattering his judgment or biasing him in one or another direction.

The writer was fortunate to be associated with two investigations of window displays which illustrate a method for the evaluation of a unit in a complete marketing plan. Both studies were carried out on drug stores in Metropolitan New York during the winter of 1923-1924. The first was of a preliminary nature and disclosed a number of weaknesses of technique that were remedied in the second. Only the latter study will be reported here.

I

The product which was made the subject of the second study was marketed almost entirely through drug stores and sold nominally at 35 cents a unit. A very attractive standardized window display was prepared for this product and was installed wherever the druggist was willing to accept it. At the time of the investigation the display could be seen in almost every type and variety of drug store in the city, and in almost every state of neglect and dismemberment.

The questions of immediate concern to the manufacturer were the following:

1. What is the immediate effect of the trim on sales in the stores in which it is used?

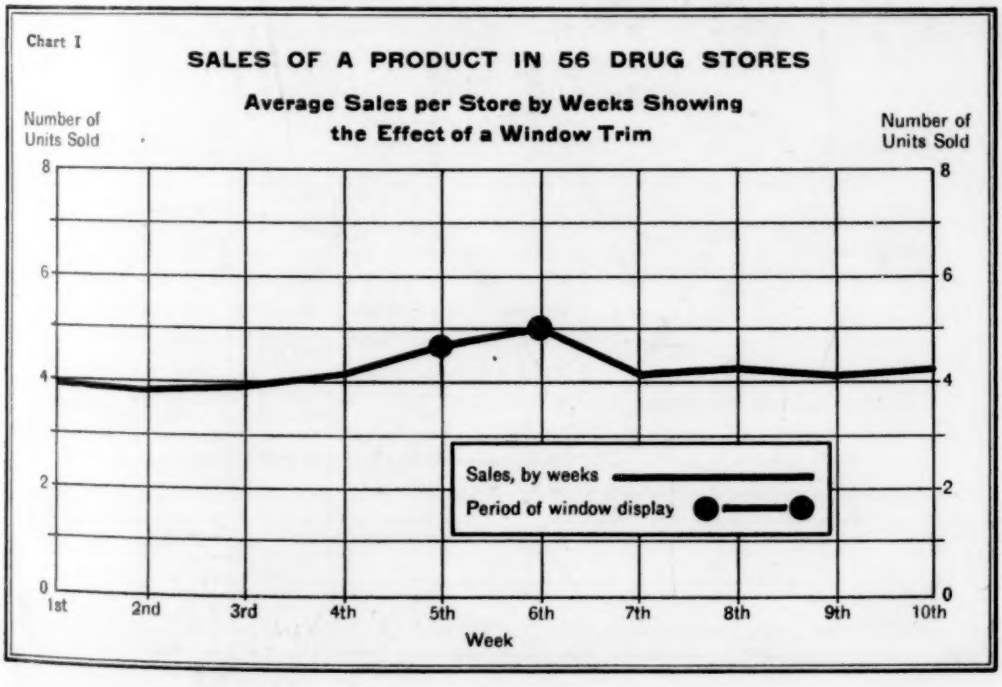


TABLE I. RELATIONSHIP OF STORE-RATING TO SUCCESS OF WINDOW DISPLAY

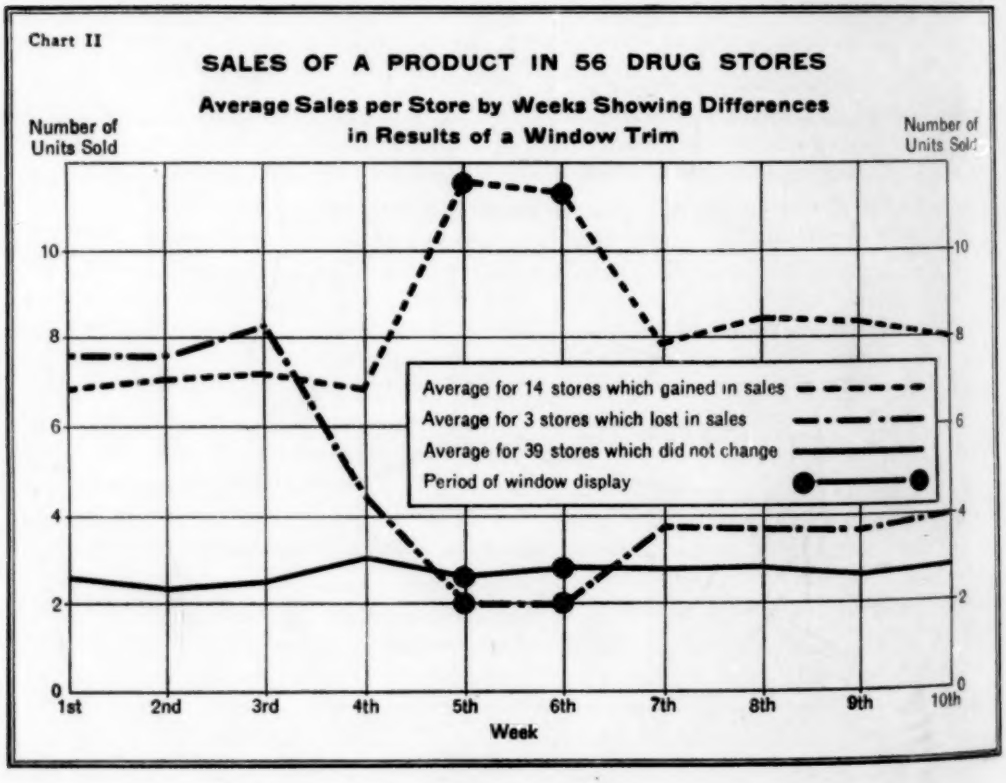
Store-rating	Number of Stores Which			Total
	Gained	Did Not Change	Lost	
A	2	4	0	6
B	8	20	2	30
C	4	15	1	20
Total	14	39	3	56

2. What is the duration of this effect?
3. In what types of stores does the trim have the greatest effect on sales?

In company with the manufacturer's salesmen the writer called on a large number of drug stores with the request that they permit us to install the window trim and make an accurate check of sales of the product before, during, and after the period of its display. A total of 228 stores complied with the request, but a number of uncontrollable factors made it necessary to throw out the figures for all but 56 of these stores on the grounds of unreliability. These remaining 56 stores represented every important section of Manhattan and the Bronx.

At each store a date was set for the installation of the trim, and arrangements were made to keep it on view for a period of two weeks. Sales were checked at each store in the following way. The writer called on the store once a week, commencing four weeks before the installation of the display and ending four weeks after it was taken out of the window, a total of ten weeks. At each call an inventory of the product was made, and the proprietor was asked the amount he had bought during the preceding seven days. From these successive inventories the amount sold each week could easily be calculated and sales

Chart II



curves drawn for each store demonstrating the effect of the display.

II

The average sales curve for the 56 stores is given in Chart I. The grand weekly average of sales previous to the display was 3.95 units per store. This was increased to 4.87 units during the display, a gain of 22%. This increase disappeared during the week following the removal of the display, when sales dropped to their customary level.

This study was carried out during a period when the demand for the product was at its highest. The general volume of sales remained at the same level throughout the period of the study. Thus no general fluctuation in sales could have affected the results.

The influence of the display on the sales curve varied considerably from one store to another. In 14 of the stores the display increased the sales, in 39 it brought no material change, and in 3 it brought a loss in sales. The 14 stores which gained increased their grand average weekly sales from 7.02 units to 11.65 units, a gain of 66%. The 3

TABLE II. RELATIONSHIP OF SELLING PRICE TO THE SUCCESS OF THE DISPLAY

Selling Price	Number of Stores Which			Total
	Gained	Did Not Change	Lost	
$ .24	1	..	..	1
.25	5	3	1	9
.26	..	..	.	..
.27	..	..	..	..
.28	..	2	..	2
.29	4	2	..	6
.30	2	23	2	27
.31	..	..	..	..
.32	..	..	..	..
.33	1	..	..	1
.34	..	..	..	..
.35	1	9	..	10
Average price...	$.280	.306	.283	.299

Chart III

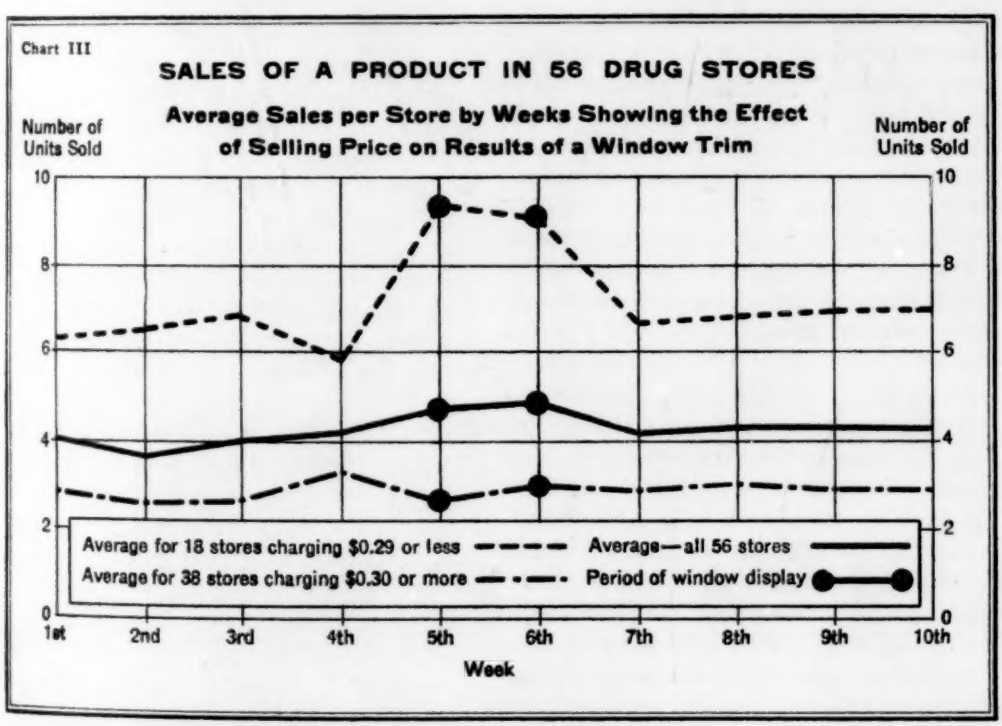


TABLE III. RELATIONSHIP OF ATTITUDE OF DEALERS TOWARD THE PRODUCT TO SUCCESS OF DISPLAY

Attitude	Number of Stores Which			Total
	Gained	Did Not Change	Lost	
Favorable	2	3	1	6
Neutral	12	35	2	49
Unfavorable	..	1	..	1
Total	14	39	3	56

which lost decreased their sales from a weekly average of 7.10 units to 2.00 units, a loss of 72%. The stores which gained in sales also raised their average sales for the period after the display. Those which lost in sales lost also during the period after the display. The sales curves for the three groups of stores are shown in Chart II.

Loss in sales accompanying the use of a window display is a revelation. One of the common excuses offered by the dealers ran something like this: "I can't afford to sell your product at the same price as the cut-rate stores around here. People see your product displayed here and get interested in it all right, but they look around and discover that they can buy it cheaper at other places. All I do is drum up trade for the other fellow." As a matter of fact, the average selling price of the stores which lost was the same as that of the stores which gained.

III

In the course of the investigation a number of facts were gathered concerning each store, such as the attitude of the dealer toward the product, the price he charged for the product, and the character of his merchandising methods. The validity of each of these facts as a criterion for selecting the best stores for display purposes was determined by comparing it with the effect of the display. The results of these comparisons are given below.

Each store was rated on the following scale:

A. Stores of reputed excellence in their respective lines giving courteous and intelligent service and catering for the most part to a discriminating clientele. The volume of business done is of absolutely no importance.

B. Efficiently managed stores catering to a clientele the majority of which is composed of people of moderate means and of at least average intelligence.

C. Slipshod stores doing business for the most part with slipshod people.

D. Not necessarily inferior to Classes B and C but of a different type. Class D stores are found in foreign districts where it is difficult for American ways to penetrate.

Table I shows the relationship of this rating to the success of the display.

Among the Class A stores 33% gained in sales, Class B stores 26%, and Class C stores 20%.

The majority of the stores sold the product at cut prices. Table II shows the relationship of selling price to the success of the display.

Judging by the average selling price, there is no relationship between price charged and the effect of the display. A decided relationship is brought out, however, if a horizontal line is drawn across the table between .29 and .30. Of

TABLE IV. RESULT OF DISPLAYING COMPETING PRODUCTS AT THE SAME TIME

	Number of Stores Which			Total
	Gained	Did Not Change	Lost	
Competing Product Displayed	2	5	..	7
No Competing Product Displayed	12	34	3	49
Total	14	39	3	56

the 18 stores charging $.29 or less, 10 (or 56%) gained in sales. Of the 38 stores charging $.30 or more, 4 (or 11%) gained in sales. These facts are brought out graphically in Chart III, which gives the average sales curves of the 18 stores charging $.29 or less and the 38 stores charging $.30 or more. The chart brings out the fact that the stores which charged less had a higher volume of sales.

Six of the dealers were very favorably disposed toward the product, one had a prejudice against it, and the rest were neutral. This was not related to the results of the display.

At 7 of the 56 stores a window was given over to a competing product at the same time. This seemed to act as a slight stimulus to sales.

The day of the week on which the display was installed seemed to be related in some obscure way to the effect on sales. Table V shows this relationship.

Apparently the dealers who installed the display on a Wednesday or a Thursday gained in much higher proportion than the other dealers.

Many of the dealers demanded payment in some form for the use of their windows. Wherever payment was necessary it was made in free goods. The policy of the company previous to this investigation was never to pay for the use of windows. The figures would indicate that better results would have accompanied a liberal payment.

TABLE V. RELATIONSHIP OF DAY OF WEEK TO SUCCESS OF DISPLAY

Day of Week	Number of Stores Which			Total
	Gained	Did Not Change	Lost	
Monday	1	3	1	5
Tuesday	..	3	1	4
Wednesday	4	7	..	11
Thursday	8	14	..	22
Friday	1	12	1	14
Total	14	39	3	56

TABLE VI. RELATIONSHIP OF PAYMENT FOR USE OF WINDOW TO SUCCESS OF DISPLAY

	Number of Stores Which			Total
	Gained	Did Not Change	Lost	
Payment Made	6	5	1	12
No Payment Made	8	34	2	44
Total	14	39	3	56

Of those who were paid, 50% gained in sales; of those who were not paid, only 18% gained.

Although the preliminary investigation was not carried out as accurately as this one, the two investigations corroborate each other on almost every point.

The answers to the three questions are:

On the average, window displays bring an immediate increase in sales.

When the display is removed from a window, sales in that store descend to their previous level. This is in keeping with the function of the display as a reminder. In order to keep the public constantly reminded, a certain number of trims must always be on display.

The indications are that the most favorable returns may be expected from stores which employ high-grade merchandising methods, which cut prices on the product, which display a competing product, and which demand some reimbursement for the use of their windows.

IV

Any unit in a merchandising plan may be evaluated by measuring its effect on sales in retail stores, provided the retail store is the main outlet for the product. The technique employed in this study

can be carried out with slight modifications to observe the sales effect of counter displays, store demonstrations, sampling through stores, changes in size and physical properties of containers, changes in price, local newspaper campaigns, house-to-house canvassing, direct-mail advertising, and couponing. It is a matter of checking sales weekly over a period of time during part of which one of these influences is allowed to exert its effect, all other influences being kept constant throughout the whole period.

To insure the success of the experiment it should be entrusted to a scientifically trained man who is able to get along with retailers and who has great persistence in gathering figures. This investigator will not only gather accurate data, but will also see that sufficient stores are covered in order to assure reliable results, that variables other than the one in question are kept constant, that no facts are suppressed, and that the results are considered as a whole without regard for the prominent exceptions, unless the cause of these exceptions is sought.

For the large manufacturer or advertising agency there is much to be said in favor of maintaining retail stores or paying a selected number of retailers for the privilege of regularly obtaining sales figures, in order to insure accurate data for the guidance of policies.

RADIO DEVELOPMENT, AND CONSUMER BUYING AND PATRONAGE MOTIVES

By GEORGE R. COGSWELL

WHEN radio, or wireless telegraphy as it first was called, became of practical use, its first application was toward securing the safety of voyagers at sea. Governments, of course, made use of it for communication between battleships, navy yards, and army units. Radio in these fields of usage has had a tremendous development, but it is with the field of usage by the general public that this article is concerned.

Early History

Previous to the World War, radio was largely communication by telegraphy. Its appeal was to an exceedingly few people who realized what was then the romance of electrical communication without wires. These pioneers usually constructed the crudest of sending and receiving sets, often for exchanging greetings with a friend in the neighborhood or in the next town. As more people did the same, talking with strangers became common. Each transmitting station had to be licensed by the government. Radio telephones, as we know them today, did not exist. Certain experimenters and college laboratories possessed apparatus capable of putting a voice on the air. Whenever the operators of this apparatus talked to their friends, or conducted tests, the pioneers marveled still more at the wonders of radio. Radio products at this period usually consisted of individual parts which the purchaser had to assemble into a complete set. These parts usually were stocked as a side-line by local electricians who sold lighting fixtures, electric lights, and so on, and who contracted for house wiring. The appeal of radio to the limited number of buyers was one of novelty or romance of the time. It usually was a hobby with them. The buying motive was purely emotional.

The period of the World War and two or three years after wrought great changes in radio. Governmental action indirectly was instrumental in causing the present-day development. The Alexanderson alternator had been developed by the General Electric Company. This machine was the most efficient at the time for transmission of radio messages. The two main customers who might buy this equipment were the United States Navy and the Marconi Wireless Telegraph Company of America. The navy was limited as to funds; and the Marconi Wireless Telegraph Company of America was controlled by Marconi's Wireless Telegraph Company, Limited, of England, which in turn was dominated by the British Government. Because of this situation, the Radio Corporation of America was formed in 1919 to acquire the Marconi Wireless Telegraph Company of America and to become the established agency for commercial communication by radio between the United States and foreign countries.

Shortly thereafter came the practical development and use of the three electrode vacuum tube for transmission work. This was a step in advance of

the alternator, and promptly was made use of by the Radio Corporation of America. In considering further uses for vacuum tubes, the idea was conceived of having transmitting stations, to provide popular entertainment, and receiving sets manufactured on a large scale, for installation in the houses of the public.

General Public Use of Radio

In the fall of 1921 the so-called radio boom started. Small manufacturers of radio apparatus sprang up throughout the country, and coincident with them broadcasting stations by the dozens. Radio magazines appeared on the newsstands. Radio became the latest apparent fad. Established wholesalers of electrical merchandise installed radio departments. Department stores had radio departments; special radio shops were opened; and even hardware stores built up radio stocks. The so-called attic radio manufacturer was a force of no small size. He bought the parts, put them together, and sold the complete set directly to the consumer. In so doing, he constituted a substantial market for radio parts manufacturers. His product was usually in no sense "a piece of furniture." Radio was supposedly the industry in which any one could make a profit, until the first real summer slump occurred in 1922. At this time, price-cutting became general, caused partly by overproduction and partly by the manufacturers' desire to dispose of old models before bringing out new ones. Radio suffered a distinct setback, and many were the predictions that the fad had passed.

Throughout this period, there was an interesting mixture of consumer buying motives or, rather, classes of consuming public. The original telegraph pioneers were recruiting to their ranks large numbers of "amateurs," largely through the efforts of the American Radio Relay League. Their interest chiefly was in communication among themselves, both by telegraph and telephone, although some built sets to receive the broadcasting on the higher wave lengths. With the large and uncontrolled growth of radio merchandise and its spread into practically every store that could find an excuse to carry it, radio merchandise became more and more a shopping[1] good to this type of consumer. Usually the resources of such a consumer were limited, and the wide-spread distribution of the merchandise in comparison with the past, almost as if it were a convenience[2] good, enabled the amateur to shop around to his heart's content. His buying motive was predominantly that of satisfying a wish to further his hobby. This was an emotional[3] motive, as distinct from the less forceful selective appeal of price.

A second group of consumers, probably the largest, consisted of those who cared nothing for telegraphic communication, but who built their own sets according to suggestions from friends and articles in radio magazines. They wanted to build sets which would bring in broadcasts from as many distant stations as possible. Here is to be noted the motive of proficiency.[4] Arrangement

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[1] ". . . . small wares for which each consumer desires to have a variety from which to make selection at the time of purchase"; M. T. Copeland, *Principles of Merchandising*, p. 67.

[2] "Convenience goods are those customarily purchased at easily accessible stores"; M. T. Copeland, *op. cit.*, p 28.

[3] For detailed exposition of consumers' buying motives, see M. T. Copeland, *op. cit.*

[4] *Ibid.*

of the parts to suit themselves indicated to a certain degree a motive of distinctiveness. Of course, entertainment was desired, particularly in the case of woman purchasers. But withal, probably the strongest motives were economy in purchase and economical emulation.

Then there was a third class of consumers; probably the second largest, who bought complete broadcast receivers. This type of consumer cared little about the mechanism of his set. He bought the complete installation with the expectation of securing reliable entertainment. Thus, with such consumers, we find the emotional motive of entertainment and the rational motives of dependability in use and quality to the fore. In addition, pride in appearance of property, happy selection of gifts, and home comfort were buying motives which sometimes came into play.

1922-1925: Changed Consumer Buying Motives

At the end of 1922 radio recovered from the summer slump, and from then until the present has proceeded to disprove the statements that it was a passing fad. It has had its summer slumps, and it still is suffering from overproduction and the dumping of obsolete models upon the market. A further hindrance has been unfulfilled promises of results that could be accomplished. Probably the greatest saving factors have been the improvement of programs presented by the broadcasting stations and the linking up of broadcasting stations through the American Telephone and Telegraph Company's long-distance lines for the broadcasting of good music and events of national importance. Interesting developments in the amplification of incoming signals have taken place, and tube and battery economy has been increased greatly by passing incoming signals through the same tubes twice at different frequencies. The question of how this broadcasting is to be paid for is not within the scope of this article. Mention should be made, however, of the possible effect of various types of payment upon consumer buying motives. For example, if advertising is to pay for broadcasting in the future, unless the advertising appeal made over the radio is conceived carefully and strictly limited, it may well offset the buying motive of entertainment. Any form of governmental tax on tubes quickly would render more powerful the rational motive of efficiency in operation.

With the current development of broadcasting has come a change in the relative importance of different consumer buying motives and a very real play of patronage motives. To the extent that any radio manufacturer distributes his products through exclusive retail agencies, patronage motives become more important.

The original corps of "amateurs" continue to transmit and to make new records for distance and speed and efficiency of operation. This is still their hobby; but they have been drawn into closer touch than before with the broadcast listeners. One reason for this is that as relative pioneers their advice naturally was sought. Another reason is that they were blamed by the broadcast listeners for causing annoying interference. Cooperation, in order to secure a thorough understanding, was essential. The purchase of apparatus for broadcast reception by these "amateurs" probably was largely for the benefit of relatives. Because of their past experience they formed an extremely discriminating type of pur-

chaser. No emotional appeal was necessary to stimulate the buying of such a purchaser; selective motives governed his purchases. He did not want his family to invest a large sum of money in a set; the simpler the control the better; and withal a high operating efficiency was necessary. Throughout the period 1922-1925 efficiency of operation, or the reduction of lost energy, was stressed more and more.

The second and largest class of consumer, as outlined above, was remodeling his set according to the latest magazine and newspaper articles which described particularly efficient sets. By efficiency is meant not only the minimum number of tubes and amount of battery power, but also the minimum number of controls, low leakage condensers and sockets, and absence of complicated wiring. Newcomers to this class of consumers quickly adopted the newest "low loss" ideas. The emotional motives of distinctiveness and proficiency were still in the background, but the buying motives of efficiency in operation and dependability in quality became more prominent.

That the third group of consumers had still a different balance between buying motives was shown by the tendency to put radio sets in fine mahogany cabinets and desks. This cabinet-work, and the inclusion of batteries and battery chargers in the complete unit, all enclosed, quickly forced the retail price of the highest-class radio set up to three or four hundred dollars. Buyers of such sets, because of the comparatively large amounts of money expended, expected dependability in quality and use, and efficiency in operation. A manufacturer who did not place his best radio apparatus in such cabinets was running contrary to the above buying motives and shortly would suffer accordingly. But the motive of pride in appearance of property has come to the fore with this class of consumer. Less and less did this class like to have in a parlor a piece of apparatus which was not in accord with the scheme of decorations. The "attic manufacturer" no longer could meet their demands, and consequently became less of a factor in the industry.

In connection with this article, an examination was made of 860 radio advertisements, which appeared between June, 1920, and June, 1925, in order to determine what consumer buying motives were appealed to. The advertisements in one radio magazine for June, 1920 and 1921, and in another for June and December from 1922 to date were used. The classification of motives was in accordance with those detailed in Professor M. T. Copeland's *Principles of Merchandising*. Advertisements were grouped broadly into those appealing to emotional motives and those appealing to rational motives. Examples of the former type of motive are pride in appearance of property, distinctiveness, proficiency, happy selection of gifts, romantic instinct, and entertainment. Examples of the latter are efficiency in operation, dependability in use, dependability in quality, economy in purchase, and economy in use.

In the analysis of the advertisements, great difficulty was encountered in some instances in fathoming what motives really were appealed to. Often the advertisements contained appeals to several motives, all about equally important. At other times, particularly in the earliest issues, no appeal was apparent to the uninitiated. In these instances, the experience of an amateur of some 12 years' standing was utilized to determine the appeal. Advertisements of transmitting apparatus in the

earlier issues were not considered. Although there were many pictorial illustrations of sets nicely enclosed in cabinets, probably designed to appeal to the motive of pride in appearance of property, they were not considered an appeal to this motive unless attention to appearance was mentioned prominently in the written matter.

In view of the difficulties encountered, the figures given in the following table should not be accepted as absolute. They seem, however, to show some tendencies and historical developments.

TABLE I. PERCENTAGE OF EMOTIONAL TO TOTAL BUYING MOTIVES APPEALED TO

June, 1920	9%
June, 1921	5
June, 1922	27
December, 1922	33
June, 1923	24
December, 1923	24
June, 1924	25
December, 1924	28
June, 1925	17

The marked increase in percentage of emotional to total buying motives appealed to, as shown in the figure for June, 1922, records the advent of the radio boom. High figures for December, 1922 and 1924, were caused primarily by a concentration on the motive of happy selection of gifts. The reason for the low figure for June, 1925, is not clear. Advertising managers may have decided that the summer is not the best period in which to induce a first purchase of radio; or the "low loss" idea and the meeting of the requirements of various circuits sponsored by radio magazines may have caused the comparatively greater emphasis on selective appeals, primarily that of quality.

The buying motives appealed to, as summarized from the tally sheet of this investigation, are given in Table II.

Position and Classification of Radio Apparatus

To date radio seems to be passing out of the pure luxury stage and into that of a "necessary luxury." A prominent manufacturer of radio apparatus recently sent out a post-card questionnaire throughout the United States in an endeavor to forecast the radio set of the future. Returns indicated that those who had no radio sets usually consid-

TABLE II. BUYING MOTIVES APPEALED TO IN RADIO ADVERTISEMENTS AND NUMBER OF TIMES USED

Date	Distinctiveness	Emulation	Ec. Emulation	Appearance of Property	Social Achievement	Proficiency	Gifts	Ambition	Romance	Personal Comfort	Alleviation of Tasks	Security from Danger	Recreation	Entertainment	Home Comfort	Handiness	Efficiency in Use	Dependability in Use	Dependability in Quality	Auxiliary Service	Durability	Earnings	Economy in Use	Economy in Purchase
June, 1920	...	...	...	3	...	2	...	...	...	...	...	...	...	...	...	4	11	5	11	6	3	...	2	5
June, 1921	2	...	...	1	...	...	...	...	...	...	1	...	...	...	...	2	10	9	20	9	...	1	7	19
June, 1922	1	...	...	2	...	3	...	4	3	...	...	4	...	3	...	5	7	4	15	5	2	2	3	9
December, 1922	...	2	2	5	...	1	12	...	4	4	1	...	...	4	1	4	20	17	19	1	1	1	3	11
June, 1923	...	...	4	...	2	...	...	...	1	...	3	1	3	3	1	5	17	12	8	3	...	1	3	6
December, 1923	1	...	1	4	...	3	9	...	3	...	3	...	...	4	1	13	19	9	27	3	2	2	3	12
June, 1924	4	...	2	2	...	5	...	...	1	...	5	2	3	4	1	6	17	14	20	...	2	2	13	8
December, 1924	4	...	1	12	...	9	19	...	4	...	9	1	...	6	2	14	68	36	15	2	1	3	5	22
June, 1925	3	...	2	1	...	3	...	1	3	3	2	1	...	...	...	9	20	13	24	1	4	2	5	13

ered the prices too high or the danger of obsolescence still too great. During only about 25% of the time that sets were in operation were they tuned to distant stations. Women practically never were interested in distant reception unless forced to tune to distant stations in order to listen to good programs. Good programs constituted the dominating factor in their interest in radio. If they could snap a switch and hear a famous orchestra through a local station, they were satisfied.

That radio has not reached the purely utilitarian stage seems to be brought out by the question relating to the equipment to be incorporated in complete installations. Cases have come to the writer's attention of purchasers who compared retail prices when purchasing $300 to $400 sets. The retailer who equipped his sets with less efficient batteries and battery chargers, and loudspeakers of poorer quality, with a consequent lower price by $25 or $30, frequently secured the sale. But that radio is becoming more nearly utilitarian seems to be indicated by the success of those in the field who have appealed to patronage motives, primarily that of service.[5] This effort extends all the way from manufacturers to distributors. A large part of the success of one manufacturer of high-grade radio products is attributable to the establishment of real service stations, to which a consumer who has bought any of the company's products for incorporation in his set can take the set for free inspection by and advice from an expert.

Today one of the most frequent questions heard is, "What kind of a set should I buy?" The answer is just as much a puzzle as ever. There are numerous first-class sets on the market; and nobody will venture the opinion that improvements will not be forthcoming in the future. But radio is fast reaching a stage where engineering talent must be supplemented by real merchandising ability. This merchandising ability not only must ferret out the most powerful consumer buying motives to which to appeal, but it also will have to solve the question of the type of goods to which various parts belong and the most effective methods of distribution of each. For example, expensive complete radio sets are, to a certain degree, specialty[6] goods. The buyers of these sets frequently have listened to a certain make of set in a friend's house and they want a duplicate. They go to the shop carrying that set. If it is a shop carrying nothing but radio, so much the better; it probably has a variety of loudspeakers to demonstrate. Here is where the shopping goods classification may apply. And it also applies to makes of sets in the case of consumers who have no particular set in mind and want to compare one after another by means of demonstrations.

Some accessories, such as batteries and tubes, assume many of the aspects of convenience goods. They are essential parts of the whole and usually are

[5] An example is that of a retailer who started in 1924 in a rich residential town of about 1,000 population, approximately 30 miles from New York City. Two other established stores in the town already carried radio sets. On the basis of a two months' house-to-house canvass, good installation work, a guaranty to replace any blown down antenna wires, and free monthly inspection of batteries and sets, he secured a net sales figure of $12,000 for the first eight months of business. This figure of sales per capita was considered by others in the trade to be excellent.

[6] "Specialty goods are those which have some particular attraction for the consumer, other than price, which induces him to put forth special effort to visit the store in which they are sold and to make a purchase without shopping"; M. T. Copeland, *Principles of Merchandising*, p. 103.

bought first from the retailer who sells the complete outfit. They are relatively alike and standard. Let a tube burn out or a battery fail when friends are invited to listen to a concert, and the situation is akin to the family automobile, loaded for a picnic, but minus gasoline and with a broken spark plug. Thus the question is raised of whether the urban electric light contractor who wires houses for electric light and sells the fixtures, and who carries radio as an auxiliary line, is a logical outlet for more than the comparatively standard accessories. His volume of sales of radio apparatus does not warrant his carrying so large a variety of complete sets as the special radio store. He has a distinct place, however, in the system of distribution of those radio parts which come under the classification of convenience goods.

Distribution Questions

The regular radio specialist today is hampered by the prevalence of cut prices, particularly in the metropolitan cities. The throwing of distress stocks on the market has taken place at such prices that a man who builds his own set and has access to these cut-price sales often feels that he cannot afford to neglect the opportunity to purchase in a big city. Fortunately, this does not affect the whole of the radio specialists' market, and, as with the case of the unit store versus the chain store, his greatest attraction is service.

There is, however, the effect of instalment sales companies, the musical instrument dealer, and the department store. The instalment finance companies, credit being equal, naturally would prefer to deal with musical instrument retailers with whom they have traded in the past. Just as the phonograph became a musical instrument enjoying public favor when the best artists' voices were reproduced, so with better broadcasting the radio is becoming analogous. This situation dovetails very nicely with the American public's apparent tendency to buy now and pay out of future earnings. This development, of course, is predicated on the ability of the music dealer and the department store to install adequate service.

The situation of the urban wholesaler who carries many makes of complete sets, is likewise changing materially. With the increased need of the retailer to appeal to patronage motives he also will need much help. As a previous order taker, it will be difficult for him effectively to "right about face" and do intensive sales promotion work unless he has assistance from the wholesaler and manufacturer. But the urban wholesaler cannot carry out the manufacturers' wishes if his effort is spread over many makes of sets. A significant development is the selection of a few urban wholesalers as exclusive agents. They carry only one make of set, and with the exception of assuming credit risks, are very much like factory branches.

The urban wholesaler should continue to be the logical channel for distribution of accessories, which fall more nearly into the classification of convenience goods, and of one or more makes of complete sets, provided he does not carry sets competing on the same price level. The wholesaler covering a rural territory should carry these too, but his handling of complete sets will depend largely upon the buying characteristics of the rural population, particularly the farmer. The farmer furnishes an extremely important market for the future. Whether he

will want "a piece of furniture" or whether he will give vent to his "tinkering propensities" and motive of economy in purchase will determine whether the business in complete sets or in parts will receive the benefit. As soon as radio wiring diagrams become more standardized, the more radio becomes known, the better the opportunity for the farmer to become a consumer of the second type, namely, those that make their own.

Needed Introspection

The developments to date indicate some very significant trends and needs for positive action in the near future. A very real struggle seems to be impending between the dealer in musical instruments and the radio retailer with regard to the distribution of high-class cabinet sets. Better manufacturing methods should result in more reliable performance, and better engineering should result in more perfect reproduction. It is assumed, of course, that broadcasting will be improved. Under these conditions it would seem that the musical instrument dealer should obtain a substantial share of this class of business.

This does not mean, however, that the radio retailer will be forced out of business. His knowledge of circuits and of the characteristics of parts makes him a logical consultant for and distributor to the class of consumer who builds his own set or who cannot afford a cabinet installation of the highest quality.

The survey of the advertisements revealed a need for manufacturers to take account of their products from a critical merchandising point of view, with the aim correctly to catalog the position of their products in the field, decide upon the most effective channels of distribution, and focus their appeals in advertisements to meet the obvious desires of the classes of consumers to whom they expect to sell. Too many advertisements lacked a truly dominant appeal, indicative of a need for introspection.

The public has accepted radio in spite of an extraordinary number of unfulfilled promises. It is fast learning what makes of apparatus are dependable in performance and in quality. Hence, it is becoming more important that the manufacturer have aggressive retail selling in the best retail outlets, and be sure that his wholesalers are prepared to cooperate with him in his selling plans.

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THE material in the Departments of the Review presented by the Student Editorial Board is chosen with regard to its interest to business executives and to the possibility of utilizing most effectively the resources at the command of the members of the Board.

The first Department, "Summaries of Business Research," comprises summaries of the results of the investigation of various business subjects. "Case Studies in Business," the second of these Departments, was suggested by one of the outstanding characteristics of the Graduate School of Business Administration, the case method of teaching. Case studies are based upon the actual experiences of business concerns; to avoid disclosure of confidential material, however, it is necessary to disguise the names of the concerns. The third department, "Legal Developments Significant in Business," has been added to permit a survey of the steps which are now being taken and which possibly should be taken in the future by courts and legislative bodies to improve the quality of the service that law can offer to business. The last Department contains critical reviews and short descriptions of new books of interest to business men.

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SUMMARIES OF BUSINESS RESEARCH

CYCLE ANALYSIS AS AN AID TO JUDGMENT OF PRICE TENDENCIES[1]

EXECUTIVES in most manufacturing enterprises constantly are required to decide upon the probable course of prices so that they may know when to buy raw materials. In industries in which raw materials constitute a large proportion of total costs, the determination of the probable course of prices becomes extremely important. During the years just prior to 1920 it was necessary to buy materials early in order to compete for business with any likelihood of making a profit. In 1920 and 1921, however, many companies suffered very heavy losses because of having larger inventories than were necessary. Had the managers of these companies been keenly alive to many warning signs around them, they might have avoided a large part of such losses. This article shows one method by which the warning signs of major price movements might be made plainer. It is far from being an infallible method and should be used only as a check upon their judgment by those who are charged with the responsibility of estimating future price tendencies.

Structural steel shapes, the subject of this study, are responsible for more than half the costs of structural steel fabricators. While the term structural steel shapes includes most of the material used in making the steel frames of buildings, the term as used in the quotations of prices in the trade journals includes only I-beams, channels, and angles. The other types of shapes, however, vary in price directly with the variations of these quotations. The prices used for study were the monthly average prices given by the *Iron Trade Review* for structural steel shapes at Pittsburgh.

The purpose of this study was to find some series of figures, no matter what it represented, which not only moved regularly in relation to the movement of structural steel prices, but also moved ahead of the latter series, so that, if the former series moved in a given manner, it might reasonably be expected that structural steel prices would move in some similar manner at a later date. Such a series, if it could be found, would furnish a barometer for the prices of structural steel.

In order to accomplish this purpose, it is necessary to understand and, in so far as this is possible, to isolate the effects of different factors which contribute to the movement of each series. There appear to be four different classes of movements possible in any series. These are (1) secular trends, (2) seasonal variations, (3) cycle deviations, and (4) residual movements. Secular trends are the movements caused by long-time economic or other developments, such as the growth of population, changes in the world's economic wealth, or gradual increases in money or in other instruments of credit. Seasonal variations are changes which tend to recur annually at about the same time of the year, such as the greater demand for funds each autumn because of crop

[1] Adapted from a thesis by J. W. Horwitz, a student in the Graduate School of Business Administration, Harvard University, in the course in Business Statistics, May, 1925.

movements, or greater sales in department stores just before Christmas.

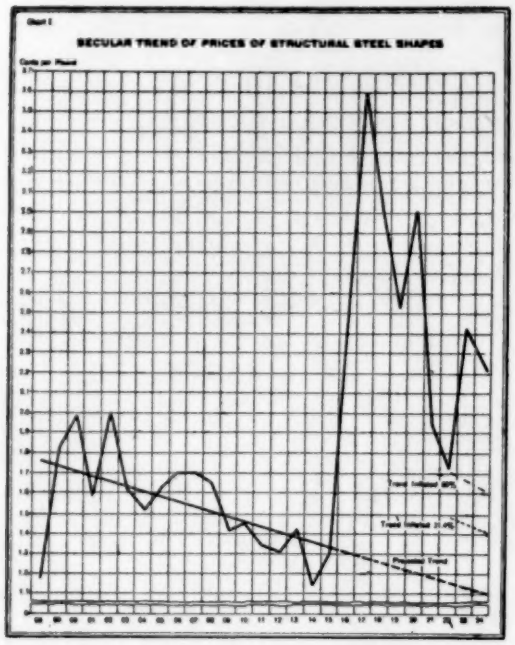
If the effects of both secular and seasonal movements are measured and removed from a series, there would remain a certain amount of more or less cyclical movement, together with an unknown amount of irregular fluctuations resulting from such uncertain and unpredictable events as strikes or fires. While both secular trend and seasonal variation can be measured with some approach to accuracy, and their effects removed from a series, the irregular or residual factors usually cannot be so removed and must be left with the cycle movements. Usually, however, these residual movements are not so important as seriously to affect the cycle movements.

There are considerable differences of opinion as to whether these so-called cycle movements are definite enough to deserve the name cycle. Certain it is, however, that almost every series has a succession of ups and downs which are not accounted for by long-time trend, seasonal variations, or the unusual and rather unpredictable residual factors. It has been noticed that these more or less cyclical movements are much alike in a great many series. It has been noticed, also, that the extremes of the cycle movements seem to be reached earlier in certain series than in others. No definite timing has ever been proved, but tendencies are frequently evident. If, therefore, a series can be found whose cycle movements occur earlier than the cycle movements of the prices of structural steel shapes, then the former series can be used as a barometer for the latter.

In order to compare cycle movements of two different series, it is necessary not only to determine the cycle movements of each series compared, but also to reduce them to a comparable basis. It is found that some series commonly vary greatly from their average, while others are usually very steady. For instance, if the amount of bread consumed were compared with the amount of pig iron produced, it would be found that the volume of bread used remained very nearly constant, while the amount of pig iron produced changed violently. If the amounts or percentages of the changes of these commodities were compared, less significance might be attached to a change of 5% in the volume of bread than to a change of 20% in the production of pig iron; unless it were known that a 5% change in the former was twice normal, while a 20% change in the latter was only half normal. To get comparability of different series, therefore, the secular trend and seasonal variation of each series are first measured, and their effects removed by expressing the series as a percentage of normal. The amounts by which these figures are above or below normal are called cycle deviations. The cycle deviations of each series are then divided by their own average deviation, or standard deviation, which gives the series expressed as cycle deviations in terms of standard deviations. In this form any two series are reasonably comparable.

No attempt will be made here to describe in detail the processes by which the cycle curve for the prices of structural steel shapes, shown on Chart I, was calculated, although some of the major difficulties encountered will be indicated. The reason for doing this is to show that this procedure is extremely important; that it is not entirely mechanical but requires the exercise of judgment, and that the results obtained are no better than the judgment used in obtaining them.

In working over the data it was at



once apparent that the period beginning with the year 1916 ought to be treated separately because of the effects of the war. These effects exhibited themselves in two ways: first, sudden and unpredictable demand for steel, and second, inflation of prices. The demand for steel was not caused by ordinary economic events, and its effect upon the prices of steel products was, therefore, not in relation to ordinary economic forces. The inflation of credit affected almost all prices in constantly changing amounts and resulted in what seems to be a new normal level of prices after the war. As a result, it was decided to analyze separately the years before 1916, which seemed reasonably normal, and keep these results separate from the admittedly more difficult period which followed.

In the later period, therefore, results are much less reliable than in the earlier period. In the first place, it was necessary to attempt to deflate the data of these later years. No deflator which makes any pretense of being accurate has yet been determined. The best that could be done was to use a deflator based on the prices of wholesale commodities as a group.[2] This was used for the period 1916 to 1921, inclusive. After 1921, however, it was felt that temporary inflation had ceased and a permanent inflation set in. This later period was figured on two bases. The first was a permanent inflation of 31.4%, which was the amount shown by the index in December, 1921; the second basis was a more or less arbitrary inflation of 50%. The results of both computations were plotted on Chart I, the latter one in a dotted line. The larger inflation appeared more nearly correct and is the only one shown in subsequent charts.

Another difficulty was encountered in projecting a trend. As may be seen in Chart I, there was little difficulty in fitting a trend to the years from 1898 to 1915 inclusive. This was done mathematically by the "least squares" method and checked up with a visual impression of what such a trend line should be. It is distinctly downward. When it came to fitting a trend line to the later years, however, it was seen to be impossible to find any trend line which adapted itself to these years because of their extreme abnormality. It might have been possible to fit a new trend to the post-war years except for the shortness of the period and the uncertainty as to how much of the period was relatively normal. Under these circumstances it

[2] This deflation was computed by comparing the cycle deviations of the "Index of Wholesale Commodities" of the United States Bureau of Labor Statistics with the cycle deviations of the "Production of Pig Iron in the United States." The former contained cycle movement plus inflation; the latter, because it dealt only with physical volume, contained only cycle movement without inflation. The difference was used as a measure of price inflation.

was decided simply to project a trend forward from 1915 at the same slope as had existed for the 18 years prior to that time.

Projecting a trend of any kind for so long a period is dangerous and when it is a downward trend of a price curve it is doubly dangerous, for it is evident that while a price might go upward indefinitely, it cannot go downward indefinitely, but meets increasing resistance the farther down it goes. The decision to use the earlier downward slope was reached only after careful study, in which it had been found that the trend had been more rapidly downward during the seven years just prior to 1916 than it had been during the period as a whole, and that this tendency had been true also of the prices of steel billets and of pig iron. One explanation of the continued downward trend may be inferred from Chart II. The data are plotted on an arithilog scale which has the merit of showing percentage relationships between different lines. A given distance vertically always represents the same percentage of change no matter where it occurs on the chart. This shows that the differential in prices between pig iron and steel billets has remained almost constant except during the war, but that the differential between structural steel and steel billets has been gradually but steadily reduced in percentage. The only test of such a projected trend is to try it and see if it looks reasonable. This was done, and the results seemed about as good as could have been expected; though it is possible that the slope is a little too steep for the post-war years. As soon as enough time has elapsed, a new post-war trend should be computed, based on the actual experience of these years.

The next step, ordinarily, is to figure the seasonal variation. In this case, however, there proved to be no seasonal variation in structural steel prices, so that this computation could be omitted.

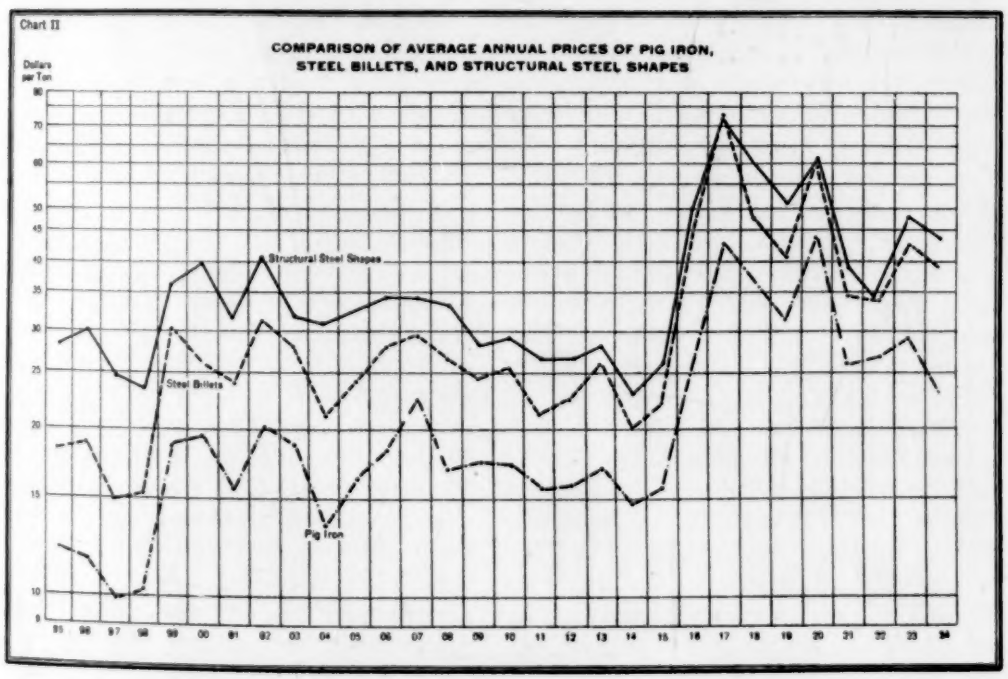
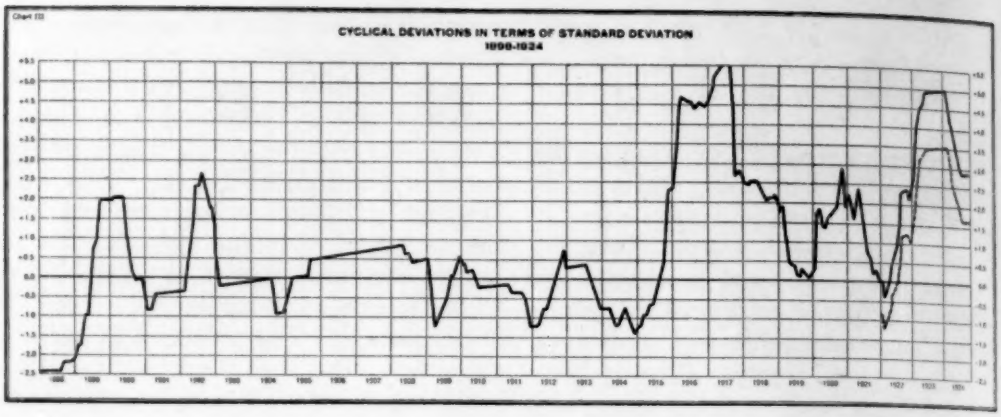


Chart II
COMPARISON OF AVERAGE ANNUAL PRICES OF PIG IRON, STEEL BILLETS, AND STRUCTURAL STEEL SHAPES
Dollars per Ton
Structural Steel Shapes
Steel Billets
Pig Iron



In figuring the cycle deviations, therefore, the only step necessary was to remove the effects of secular trend. Finally, then, the cycle deviations for the series were expressed in terms of standard deviations, as explained before, and the whole was plotted on Chart III. It will be noted that the heavy horizontal line represents normal, and that the prices of structural steel shapes are represented as being so many standard deviations above or below this normal.

Comparison of the curve shown on Chart III was made with over 200 curves similarly computed to determine with which of these the closest correlation existed. From among all these charts were selected four which seemed to have the greatest similarity of cycle movement to that of the prices of structural steel shapes and which seemed to move in the same direction considerably earlier than did the latter curve. These four curves represented the Speculative, or "A," Index of the Harvard Economic Service, the Dow-Jones "Index of Industrial Stock Prices," Bradstreet's "Index of Wholesale Commodity Prices," and "Production of Pig Iron in the United States." Comparisons of each of these curves with that of the prices of structural steel shapes are shown on Charts IV, V, VI, and VII.

An interpretation of the results which have been obtained is quite impossible without considering the economic background of the curve of structural steel prices. In 1898, the first year shown on Chart III, the country was just beginning to recover from the long depression following the panic of 1893. During the same year a great many horizontal combinations took place in the steel industry, particularly among makers of finished-steel products. Business was *very* good in 1899, prices were *very* high, and the new combinations prospered. The Carnegie Steel Company, which had attained a commanding position among makers of steel billets, sold most of its products to the new combinations. In the latter part of 1900 demand for steel dropped off, and prices became much lower. The consequent loss of volume caused the makers of finished steel to decide to increase their volume by building plants for making their own iron and steel. This proposal was met by Mr. Carnegie, in January, 1901, with an announcement that he would build a huge plant to make his own steel into finished products. Because Mr. Carnegie was acknowledged to be the ablest steel operator in the country and was in a

position, financially, to carry out his threat, the finished-steel makers were very much alarmed and decided to try to buy him out. The ensuing negotiations resulted in the formation of the United States Steel Corporation, which took over the Carnegie Company and all the large steel combinations, forming a vertical combination which controlled about 60% of the steel capacity of the country and owned or controlled vast ore lands in the Lake Superior district.

This new corporation started business on April 1, 1901, and almost at once began to have a steadying influence on prices of iron and steel. Its control over steel prices was greater than over iron prices, for it sold no pig iron, but, on the contrary, was a large purchaser. Even here, however, it managed to have some effect by going into the market or staying out of it, according as prices of pig iron went down or up. At this point it is worth while referring once more to Chart II and noting that the differential between the prices of pig iron and of steel billets has been maintained, but that the differential between the prices of the latter and of finished steel has been reduced to a point which made it difficult for competitors to exist in the finished-steel business if they did not make their steel at least from pig iron and probably from ore. As a result, the business in finished-steel products, such as rails, tubes, sheets, and structural steel shapes, has been more and more confined to a few very large companies. A further result was the relative ease of forming price pools in these lines; a situation which actually developed early through the famous Gary dinners. These pools were in existence most of the time through 1908. As a result, the price of structural steel did not drop as other prices did at the time of the panics of 1903 and 1907. The pools were not quite able to keep the price steady after such panics, but were able to delay the drop a considerable time after it normally would have taken place. As a result of these pools, the price varied greatly only once from early 1903 to early 1909. After that time, however, changes in laws made it

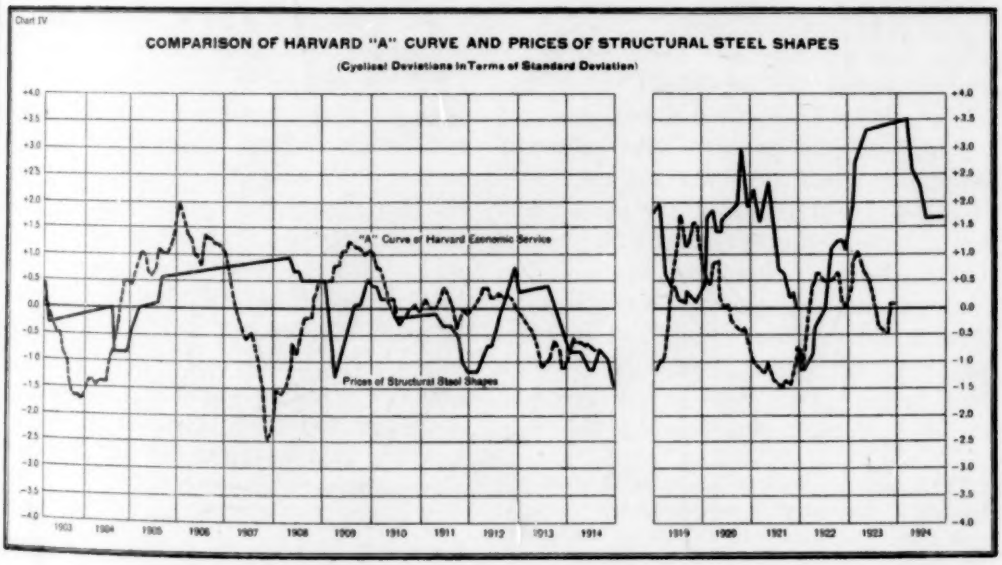


Chart IV
COMPARISON OF HARVARD "A" CURVE AND PRICES OF STRUCTURAL STEEL SHAPES
(Cyclical Deviations in Terms of Standard Deviation)
"A" Curve of Harvard Economic Service
Prices of Structural Steel Shapes

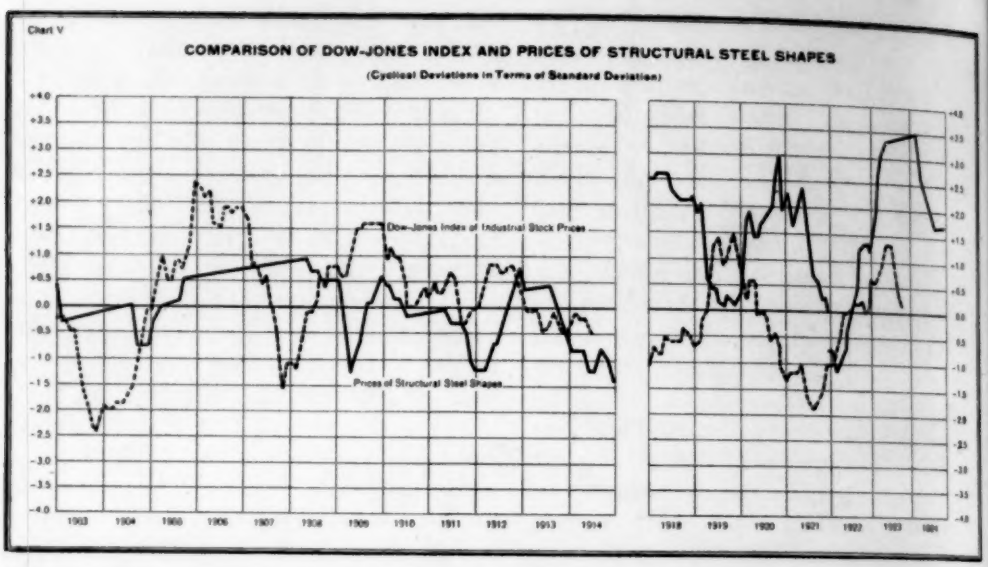


Chart V
COMPARISON OF DOW-JONES INDEX AND PRICES OF STRUCTURAL STEEL SHAPES
(Cyclical Deviations in Terms of Standard Deviation)
Dow-Jones Index of Industrial Stock Prices
Prices of Structural Steel Shapes

dangerous to agree to keep up prices, which, consequently, began to exhibit more normal tendencies, though the United States Steel Corporation still acted as a moderating influence by its dominant position in the trade.

No extremely violent price movements took place until the war had been in progress for about a year. At that time the receipt of war orders in large amounts gave impetus to an extraordinary rise in prices, which ended only when the government fixed prices in 1917. After the armistice, there was a temporary depression in business and a rapid fall in prices. The price of structural steel declined sharply, and then remained at about the same level for about eight months, until December, 1919. By that time post-war inflation had set in and carried the price of structural steel above the war-time fixed price, but by August, 1920, the reaction had begun [3] and steel prices dropped steadily, though at first much less rapidly than other prices, until in February, 1922, they reached a low point about equal to the average price in 1913. Then business began to improve; the building industry made rapid strides in catching up with postponed programs; automobile production increased to new high levels; and by 1923 the railroads came into the market for large amounts of steel. Because these three industries use more than half the total steel production, their combined demands sent prices up very considerably, until the slump of the spring of 1924 brought them down to about their present levels (April, 1925), which are nearly 50% above the monthly averages of 1913. It is very interesting to note that during the feverish days of 1917 and 1920, the price of structural steel lost all its normal relation to the price of steel billets; and, in several months in each of these years, structural steel actually could be purchased at a lower price per ton than steel billets.

With this background in mind, the comparisons shown on Charts IV, V, VI, and VII may be more readily interpreted. In each case the curve, com-

[3] This drop in price does not show on Chart III, because of the use of a deflation index which, at that time, dropped as rapidly or more rapidly than the actual prices of structural steel shapes.

pared with that of the prices of structural steel shapes, showed the effects of changes in business conditions much earlier than did the latter. This was particularly true, of course, during the time when price pools existed. The period after the war again shows early movements of the four series being compared with structural steel. The least satisfactory period is the one from about 1910 to 1915. Even there, however, these curves seem to move in the same way as does the curve of structural steel prices, but they do not exhibit as great or as regular a lead as in the other two periods. Moreover, none of these curves is very consistent in its relation to the curve of structural steel prices, either in the timing or the extent of movements. For instance, the Harvard "A" curve is the only one to give really adequate warning of the drop in steel prices in the early months of 1910, but it does not indicate to any considerable extent the further drop late in 1911, nor does it anticipate greatly the rise in the early part of 1922. The curve of Bradstreet's index fails entirely to forecast the drop in the early part of 1910, but does give impressive warning of the further drop in 1911 and gives equally impressive warning of the rise in 1922. Each one of these curves seems to have its successes and its failures, though seldom at the same time.

Because each of these series was at times very irregular in the amount of its lead and the extent of its cycle swing as compared with that of structural steel prices, it was decided to attempt the formation of one index which might be expected to maintain a more constant relation to the cycle swings of the curve of structural steel prices than did any one of the curves on which the index was based. This was done by averaging the cycle deviations in terms of standard deviations of the four series which have just been discussed. This average was then plotted as shown on Chart VIII. Some of the data were not available during the war, so the index was computed only from 1903 to August, 1914, and from 1919 to 1923, inclusive.

It is at once apparent that such an index, being an average, has less lead at

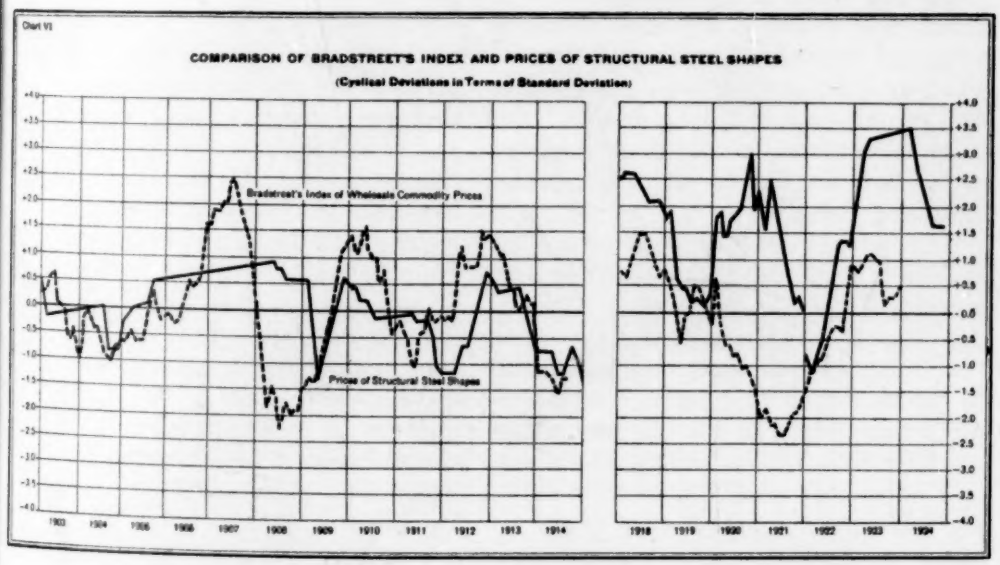
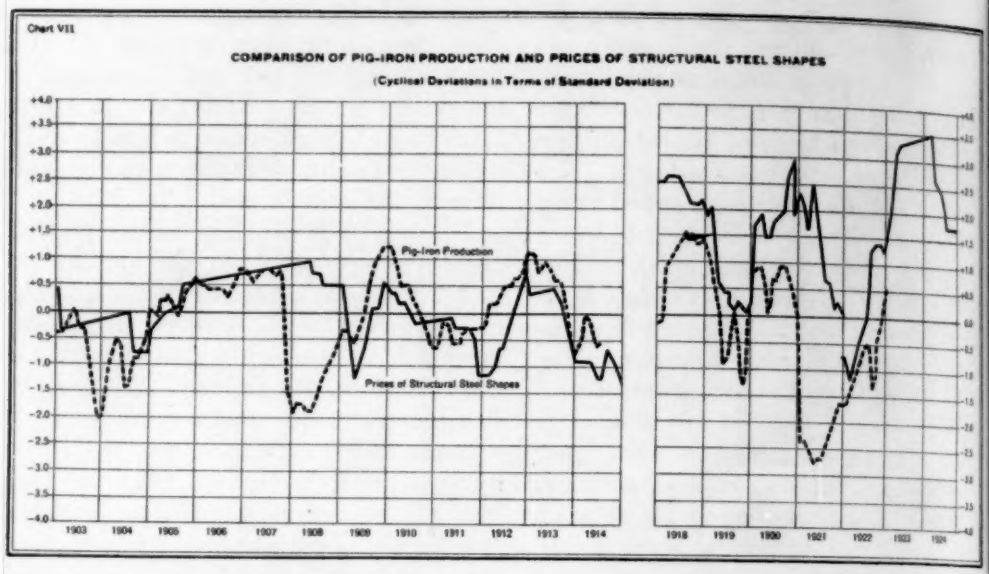


Chart VI
COMPARISON OF BRADSTREET'S INDEX AND PRICES OF STRUCTURAL STEEL SHAPES
(Cyclical Deviations in Terms of Standard Deviation)
Bradstreet's Index of Wholesale Commodity Prices
Prices of Structural Steel Shapes
1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914
1919 1920 1921 1922 1923 1924



any one time in structural steel prices than has the earliest moving series. On the other hand, it still has a very considerable lead at every point at which any one of the component series shows a lead. It also has the very considerable merit of not being greatly affected by residual factors which might affect any one of the component series, but which might not affect the price of structural steel. For example, the steel strike in 1919 and the railroad car-shop strike in 1922, each seriously affected the production of pig iron but did not affect the price of structural steel. Such irregular movements are hardly noticeable in the combined index.

The index, therefore, because it is an average, is slightly less sensitive but more reliable than any one of its component parts. This applies not only to the timing of cycle movements, but also to the extent of their upward or downward movements. If one felt that either of these factors, the timing or the extent of swings, could be counted on to act with great regularity, it might be more important to watch for sensitiveness, but it is not felt that any one index maintains a sufficiently regular relation to structural steel prices to make sensitiveness more important than securing the utmost reliability. The results obtained are none too reliable at best, and it certainly would be unwise to use figures which, although they might be available earlier, might result in leading one astray.

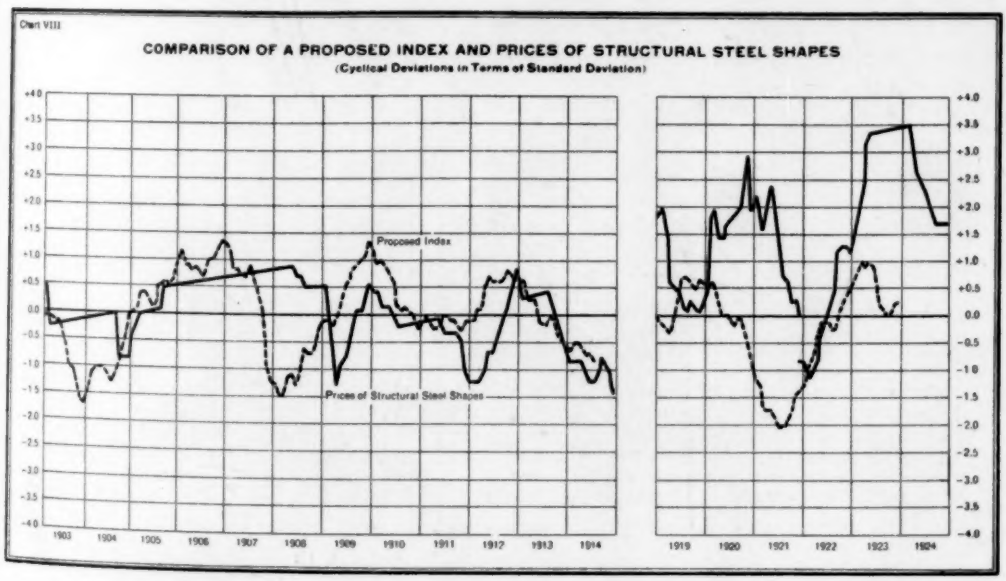
When Chart VIII is examined for visual evidence of significant relations between the two curves, it will be found that the index has a very marked lead and very regular time relations during the earliest and latest years, but much less lead and much less regularity during the intermediate period from about 1909 or 1910 to the beginning of the war in 1914. This middle period has less violent fluctuations and somewhat less regular cycle movements. It is quite apparent that in the earlier years the timing and extent of changes in structural steel prices were very much affected by price agreements, which did not exist at later dates. At only one point does the index fail entirely to

forecast the movements of structural steel prices, and that is at the end of 1909 when both curves moved at the same time. Even here, however, the intelligent user of the index might have been warned of an approaching change, for both the index and steel prices had been moving upward to an unusually great extent, and with unusual rapidity. Such a condition might be expected to result in a sudden reaction of some sort. The point at which the index is weakest is in forecasting the extent of price swings, for both in 1911 and in 1919 it fails to indicate the extent of the cycle swings of structural steel prices, though the timing and direction of these movements is rather clearly indicated.

In order to check up the judgments obtained by visual study of these curves, the latter were correlated mathematically according to the formula of Colonel Leonard P. Ayres. For this purpose the entire period was divided into three parts, 1903 to 1909, 1910 to 1914, and 1919 to 1924, inclusive. In the first period, the mathematical computation indicated a high degree of correlation when the index was figured as having a 12 months' lead over the prices of structural steel; in the second period, it showed fair correlation with a lead of 7 months; and in the last period, very high correlation with a lead of 8 months. This directly corroborates the results of visual examination.

Probably the most interesting thing to observe about these charts is that the lead of the index and of its component curves has been largest, and the correlation highest, at times when changes have been most violent. This seems to indicate that the index is a good barometer of important cycle changes in the prices of structural steel, but a much less dependable barometer of more gradual or less extensive changes. Furthermore, it seems to be true that the barometer is more to be trusted to forecast the direction of major price movements than the exact timing or extent of such movements.

It is extremely important to realize these limitations to the use of such barometers and especially to bear in mind that, after all, the barometer is



only a mechanical device for checking up the personal judgment of the individual and must never be substituted for such judgment. Moreover, even if it is understood that such a barometer can only be used as a check on one's judgment, it must not be expected that it will at all regularly indicate the amount of the change that will occur, nor that it will give clear indication of the smaller price movements. The changes which take place in any series such as structural steel prices are the result of the interplay of very complex economic forces. Not all of these forces are at work in the series chosen as barometers, nor, if they are at work, do they exert the same relative strength; so that the action of the barometer will never be exactly the same as the action of the series with which it is compared. The most that can be expected is that, in a large majority of cases, the cycle swings of the barometer index will indicate that a major price change, in the particular commodity under consideration, is about to take place, and that it will do this sufficiently in advance to allow the user to make preparations for the expected change. Incidentally, it may be added that if such measures were generally taken they would do much to mitigate the severity of the cycle swings.

This study deals with only one raw material. Unquestionably, a similar method could be used in studying a great many other commodities, although probably with varying degrees of success. It is of the utmost importance to realize that the index is certainly no better than the judgment of its maker, that with the best of judgment the index will not be entirely dependable, and that the final results must only be used as a check upon one's own judgment rather than as a substitute for it. If these limitations are kept constantly in mind, there is no reason why cycle analysis should not be a valuable business tool.

CASE STUDIES IN BUSINESS

DISTRIBUTION OF SECURITIES OF A PUBLIC SERVICE CORPORATION

THE Manster Gas and Electric Company furnished the entire gas and electric service for a city, and its surrounding territory, having a population estimated to be in excess of 800,000 at the beginning of 1924. Its operations extended into the suburbs and surrounding counties and included the supply of all power used by street railways. The territory served by the electric distribution system embraced an area of 395 square miles, while the gas distribution system covered approximately 110 square miles.

The company had generating stations aggregating 220,000 horse-power capacity. In addition, installations aggregating 53,300 horse-power were to be completed during 1924. The company also had an advantageous contract for power with a hydro-electric development located about 40 miles north of the city. The gas plant of the company at the beginning of 1924 had a capacity of 60,000,000 cubic feet which was to be extended to 67,000,000 cubic feet during 1924.

The number of customers of the company had increased from 99,000 consumers of gas and 16,000 of electricity in 1910 to 165,000 of gas and 126,000 of electricity at the end of 1923. A wide variety of manufacturing establishments, stores, apartment houses, office buildings, hotels, restaurants, and newspaper printing companies were furnished with light and power by the company. As a result of this wide diversification of the industries served, the company's physical volume of business had manifested an almost uninterrupted series of increases since 1910.

The owners of the company's common and preferred stock totaled 11,449, of whom 7,662, or 67%, were residents of the state in which the company was located. Over 60% of the owners of the common stock of the company lived within the city. Twelve thousand nine hundred and seventeen persons owned

TABLE I. EARNINGS OF THE MANSTER GAS AND ELECTRIC COMPANY, 1914-1923

	Gross Income	Operating Expenses and Taxes	Net Earnings	Fixed Charges	Surplus Available for Dividends, Depreciation, etc.
Year Ended June 30, 1914	$ 6,400,896	$3,333,821	$3,067,075	$1,567,689	$1,499,386
Year Ended June 30, 1915	6,789,402	3,576,583	3,212,819	1,640,361	1,572,458
Year Ended June 30, 1916	7,431,769	3,848,077	3,583,692	1,580,058	2,003,634
Year Ended June 30, 1917	8,498,809	4,480,165	4,018,644	1,672,223	2,346,421
Year Ended June 30, 1918	10,619,589	6,415,684	4,203,905	2,071,340	2,132,565
Year Ended Dec. 31, 1919	12,813,617	8,012,906	4,800,711	2,283,622	2,517,089
Year Ended Dec. 31, 1920	15,433,458	10,451,791	4,981,667	2,475,192	2,506,475
Year Ended Dec. 31, 1921	16,612,388	10,584,582	6,027,806	2,963,761	3,064,045
Year Ended Dec. 31, 1922	20,376,084	11,451,727	8,924,357	3,405,688	5,518,669
Year Ended Dec. 31, 1923	22,221,699	12,588,592	9,633,107	3,232,095	6,401,012
10-Year Average	$12,719,771	$7,474,393	$5,245,378	$2,289,203	$2,956,175

bonds of the company and its subsidiaries. They held about three-fifths of the total outstanding bonds while the remainder were retained as investments by corporations such as savings banks and insurance companies. The earnings of the company had been excellent for the past 10 years (see Table I).

In 1919, out of a total capitalization of $68,565,000, 76.21% ($52,253,000) was bonds, the remainder being divided between common and preferred stock. At the end of 1923, out of a total capitalization of $84,095,000 only 68.82% ($57,874,179) was bonds. The balance sheet of the company as of December 31, 1923, was as shown in Table II.

The plans for the expansion of the company during 1924 necessitated the sale of a security in the early part of that year to obtain the requisite funds. The financial budget of the company required a capital expenditure of $4,000,000 for the proposed expansion of gas and electric plants, transmission lines, and distribution systems.

There were two problems to be considered in connection with the issue of securities. First, what type of securities should be issued? Second, should the company attempt to distribute securities through its own salesmen, or should the issue be sold to an investment banking syndicate? An issue of common stock was not considered because the control of the company was vested in common stock, the holders of which did not desire to weaken their position or to subscribe additional money. Preferred stock had no voting powers, except with respect to a proposed amendment to the charter of the company, a sale of property or assets, a dissolution of the company, or a failure to pay full dividends on preferred stock for a whole year. Provisions in the authorization for the issue of preferred stock made it unnecessary

TABLE II. CONSOLIDATED CONDENSED BALANCE SHEET, DECEMBER 31, 1923

ASSETS

Invested Assets:		
Plant and Equipment, including Real Estate and Franchises		$84,991,917.97
Unfinished Plant Investment		252,354.51
Investment in Stocks and Bonds, etc		895,166.76
Total Invested Assets		$86,139,439.24
Current Assets:		
Cash on Hand, in Banks, and with Fiscal Agents	$3,302,121.88	
Accounts and Notes Receivable	2,775,138.32	
Subscriptions to Capital Stock—Common	56,739.99	
Subscriptions to Capital Stock—Preferred Series "B"	12,089.56	
Materials and Supplies	3,010,439.40	
Work in Progress—Account of Consumers	34,545.69	
Other Current Assets	1,920,500.00	
Total Current Assets		11,111,574.84
Advances Re: Employees' Stock Subscriptions		667.17
Sinking Funds—Invested		762,519.05
Sinking Funds—Uninvested		92,402.60
Sundry Deferred Charges		59,303.17
Total Assets		$98,165,906.07

that additional issues of stock be offered to previous stockholders of either common or preferred stock.

Decision of the Company

The directors of the company decided to issue 6½% cumulative preferred stock to obtain the necessary $4,000,000. Half of this amount was to be sold through their own sales force and the remainder was to be disposed of by sale to the company's investment bankers. An individual customer of the company was to be limited to the purchase of five shares of the new preferred stock. The customers oversubscribed the allotted $2,000,000.

The investment banking firm with which the company was associated took another investment banking firm into the purchasing syndicate. These two firms in turn allotted various amounts of stock to retail bankers who had had previous relations with them in selling syndicates. The preferred stock was sold at 101 to yield 6.45%, and was disposed of without difficulty.

Bonds versus Preferred Stock

The company had an excellent credit standing among banks and investors. Its issues had always been favorably received and it enjoyed a reputation throughout the territory which it served

TABLE II. *(Continued)*—CONSOLIDATED CONDENSED BALANCE SHEET, DECEMBER 31, 1923

LIABILITIES

Capital Liabilities:		
Manster Gas and Electric Company:		
Common Stock		$17,387,500.00
Common Stock—Subscribed		144,700.00
Preferred Stock—Series "A" (8%)		5,000,000.00
Preferred Stock—Series "B" (7%)		1,952,900.00
Preferred Stock—Series "B" (7%) Subscribed		47,100.00
Stewart Electric Company—Preferred Stock (6%)		1,000,000.00
Union Building Company—Preferred Stock (6%)		688,400.00
Bonds		57,874,500.00
Total Capital Liabilities		$84,095,100.00
Current Liabilities:		
Accounts Payable	$ 702,515.34	
Customers' Extension Deposits	359,376.02	
Unpaid Wages (not due)	79,286.29	
Accrued Interest on Bonds, Notes, etc.	1,131,404.69	
Bonds Called for Redemption and Term Notes Matured	12,000.00	
Dividends Payable January 2, 1924	481,861.25	
Total Current Liabilities		2,766,443.59
Sinking Fund Reserves		155,750.29
Sundry Reserves, Accruals, etc.		587,582.68
Reserve for Depreciation (Renewals)		5,338,607.85
Reserve for Contingencies		408,604.37
Funded Debt Retired through Surplus		234,500.00
Surplus		4,579,317.29
Total Liabilities		$98,165,906.07

as being a company which always issued reliable securities. This is a most important factor, for it made it possible to sell either bonds or preferred stock with the assurance of a desirable market at the prevailing rates. The stock market, moreover, at that time was in such a condition that sale of either type of security would not be difficult and would probably yield relatively high prices.

Cost of Distribution

The cost of distributing bonds usually was lower than the cost of distributing an equal amount of stock. Investment bankers were willing to distribute bonds for one-half to one-third their usual charges for a stock issue, because bonds were sold in larger blocks than stocks, and because many conservative investors would buy bonds but not stocks. As a consequence, selling costs were lower for bonds than for stocks. In addition to the lower cost of selling, bonds have another advantage over stocks in that the total interest charges are usually smaller than the total dividends on an issue of preferred stock of a similar amount.

Earnings

Conservative investment bankers usually require that net earnings after depreciation shall be double the fixed charges on the bonds they handle. This rule is observed primarily for the security of the purchasers, because it assures the stability of the company and its ability to meet interest requirements. A smaller margin is assumed to be insufficient to meet the unusual hazards of business. A study of Table I indicates that past earnings of this company have been satisfactory. The average earnings for the past 10 years, after all fixed charges and taxes, but before depreciation charges have been met, are $2,956,175, which amount is only moderately favorable. Despite the severe setback, however, which most industrial concerns suffered during the depression of 1921-1922, this public utility has shown a steady increase in profits. A factor of major importance is that the margin of safety of earnings available either for interest on bonds or dividends on preferred stock for the past two years has been very satisfactory. It is these latter years' earnings that are the most significant, since they result from rate increases and a growth of the company's business. An increase in the size and earnings is of greater importance in the case of a public utility than in an industrial concern, because the utility is of a monopolistic nature and the demand for its products or services is more stable.

It is evident, then, that the earnings of the company are favorable for a bond issue. It must be borne in mind, however, that there is always the danger in a public utility that favorable ratios may not be maintained because of increasing costs without a corresponding increase in rates. Furthermore, where net earnings are in excess of a reasonable compensation for the invested capital, there is always the possibility that the public service commission will step in and reduce the rates to give the public the benefit of the excess profits.

Breadth of Market

Bonds are sold in a wider and more conservative market than are stocks, and hence the market price is less affected by conditions in a particular locality. A larger portion of bonds are usually purchased by savings banks and insurance companies which hold them

until maturity. Their market is less active than that for stocks, and the price is less affected by temporary conditions such as earnings. Since the credit of a company is often influenced by the price of its securities, a stable market is desirable.

At the end of 1923 the capitalization of the company consisted of 68.82% bonds and 31.18% stock. Although there is no generally recognized rule on this point, the ideal financial set-up may be considered to be no more than 60% bonds and no less than 40% stock. An additional increase of stock at this time, therefore, would result in a capitalization plan which would be more nearly in accord with the usual standard.

Relations with Public

The chief difficulties which the majority of public service corporations have arise from their relationship with customers and with public service commissions. A few companies have constant litigation before the commissions on account of the demands of customers to have the rates lowered. It was probable that if 4,000 or 5,000 customers became security holders of the company, an interest favorable to the company would be created and, as a result, the relations of the company with the public, with customers, and with public service commissions might be made even more favorable. This interest could be created, however, more easily through the sale of stocks to customers than through the sale of bonds. Stock gave the holder a proprietary interest in the company, whereas the owner of bonds held the position of a creditor. The income of stockholders of the company depended upon the maintenance of rates and amicable relations of the company with customers. The security of bonds was in the value of fixed assets. It would be easier to sell stocks to customers, moreover, because stock denominations were smaller than those of bonds. Many customers of the company would be unable to purchase bonds.

Stock could be sold on the instalment plan, which is not a method customarily employed in the distribution of bonds. This would be of considerable advantage in getting the stock into the hands of many small investors who were using the company's products. The Manster Company was located in an industrial center and a large percentage of its customers were probably of the working class, and would, therefore, be particularly interested in purchasing stock on the instalment plan. As wide a distribution of securities among customers as possible would be of the most benefit to the company.

Future Security Issues

One of the most important things to bear in mind in the selection of a particular type of security is that all possible means for securing capital in the future must be left open. In periods of industrial inactivity and depression bonds will probably find a more ready market because of the greater certainty of the return from them and because of their additional security. An issue of preferred stock at this time, then, would be preferable to that of bonds because of the greater freedom given the company for future financing.

The issue of preferred stock would improve the credit position of the company at the banks because of the greater percentage of capital furnished by the owners in distinction to the capital furnished by the creditors. The sale of stock would give bankers a greater margin of safety because the percentage

of unpledged assets would be increased.

A minor factor favoring the sale of stock is that in many states, and also under the United States tax laws, dividends are either exempt from taxation or are taxed at a lower rate than bond interest. This is because the company pays its tax on net income after deduction of interest charges. The tax, then, has been partially collected on dividends before they are received by the stockholder, but has not been paid on the interest due bondholders.

Failure to pay interest due on bonds would lay the company open to bankruptcy proceedings. On the other hand, failure to pay dividends on stock is a minor matter in comparison. If the preferred dividends were passed for a whole year, the preferred stockholders would become entitled to a voting power, but the common stock would probably still be in control. It is probable that a failure on the part of the company to pay dividends on preferred stock that had been sold to customers would not create any substantial amount of ill will against the company, but would rather work out in the form of a benefit to the company. It would constitute a very favorable basis for going before the public service commission and applying for an increase in rates. The public service commission would be willing to adjust rates to provide a fair return to the stockholders, particularly if the majority of the stockholders, or even an appreciable number, were members of the community over which the commission held jurisdiction.

Company's Salesmen versus Investment Bankers

Because of the foregoing considerations and the obvious advantages at the time of preferred stock over bonds, the company's decision to issue preferred stock to obtain the necessary $4,000,000 was wise. Application was made to the public service commission for its approval on the issue and it was granted immediately, with the provision that the stock be sold at par less reasonable commissions to bankers.

If the company attempted to distribute stock through its own salesmen, selling costs probably would be smaller than if the distribution were made through a banking syndicate. The company had a reputation throughout the territory in which it operated as issuing reliable securities and believed that with a bonus of not over 1% to its salesmen and collectors, the issue could be sold without impairing their efficiency in the performance of other duties. In addition, the use of the instalment plan would facilitate sales. Many consumers were stockholders already, and probably in most instances would be glad to have an opportunity to purchase additional stock. If direct distribution were employed, it would be possible, by limiting the number of shares which were sold to any one individual, to get wide distribution as well as to create favorable public opinion. Concentration of selling effort on the company's consumers would result in a measure of consumer pride in ownership of the company's securities, which would be likely to have its effect toward prevention of future demands for lower rates.

The effect of this plan on the salesmen of the company must not be overlooked. They were to be allowed to sell the new issue of stock in connection with their regular duties. The commission to be paid them for all sales, though small, would be an addition to their normal earnings and would thereby constitute an incentive for them to effect the complete sale. Not the least

of the benefits of this method of distribution would be the increased good-will on the part of the salesmen and collectors for their employers.

This point may be carried farther to a consideration of the effect on the employees of the company if stock is sold to them through the efforts of the company's own salesmen. Employee ownership of stock entails an added incentive for the employees to work harder for the best interests of the company, since they are to profit directly thereby. It reduces labor turnover and promotes thrift and contentment. Amicable relations between a public utility, in particular, and its employees have a powerful influence in the company's relations with both public officials and capitalists. This fact is admirably illustrated in the case of the Philadelphia Rapid Transit Company under Mr. Mitten's management. Here the effect of employee ownership and cooperation has resulted not only in higher wages, but in low rates and in dividends to stockholders.

Selling all of the stock to customers would limit the territorial distribution of the securities. A wider distribution would be given if the sales were made through a banking syndicate. This was especially true in the case of the Manster Gas and Electric Company, for the bankers to whom it was accustomed to sell securities were located in a distant part of the country and made the majority of their sales in that territory. Wide territorial distribution had two advantages. In the first place, it served to make the issue more widely known, and as a consequence, future issues of similar securities by the company could be marketed more easily because unfavorable conditions in one locality would be offset by more favorable conditions in other places. In the second place, if the securities were sold in a limited territory, a disaster in that territory such as a crop failure would result in the dumping of large blocks of the security on the market.

It was important also for a company which expected to issue securities from time to time to maintain friendly relations with investment bankers. In periods of depression in the stock market and in general business the company might find it impossible to market its securities without the aid of the bankers. Investment bankers, however, would probably not be entirely opposed to the company's selling some of the preferred stock to its customers, because this step would increase the good-will of the company among its clientele and would thereby tend to insure the favorable action by public utility boards in securing just and fair rates.

Selling stock through an investment banker would insure that the proceeds of the sale would be available without delay. It is customary for this class of bankers to buy a stock issue outright. On the other hand, an attempt to distribute stock through company salesmen would necessarily entail considerable delay in assembling the amount of money required, particularly if sales were made on a partial-payment basis. There would be the time and expense of training or instructing the sales force as well as the details involved in underwriting the issue and maintaining the market price. It is important, moreover, that some funds become available without any great delay, for they are to be used in capital additions to be made at once.

It seems probable, therefore, that the directors of the Manster Gas and Electric Company adopted a wise course in selling half the issue through investment bankers and the remainder through their own sales force. By this method it was possible to obtain the needed

advantages of both while avoiding the major disadvantages applying to either.

General Significance

It is impossible to state arbitrarily when a certain type of security should be used to finance a company and when it should not be so employed. The entire situation must be considered carefully in each individual case; then the specific or peculiar conditions applying at the time should be analyzed. There are certain definite advantages resulting from the use of bonds which cannot be obtained from stocks, and conversely, stocks will yield results which can be had with no other type of securities. In this particular case, it is to be noted that the advantages of a better capitalization structure, wider customer and employee ownership, and the improvement of bank credit coupled with the unusual market situation existing at the time, made it feasible to finance budget requirements by the use of preferred stock in spite of the lower price at which the money could be obtained through the sale of bonds. Although the sale of securities may be effected generally to greater advantage through an investment banking house, there are instances, as in the event of a need to increase customer or employee ownership, when it is advisable to make use of the company's sales force for this purpose. It is at all times essential to insure that future financial requirements are amply protected; this can best be accomplished by leaving open for future use any method of financing which may be the only method that can be used in time of stringency, and by maintaining friendly relations with investment bankers.

ASSUMPTION AND TRANSFER OF RESPONSIBILITY

MANY of the ills of an industrial concern which are ascribed to faulty organization will be found on analysis to arise from failure on the part of those involved properly to assume and to transfer responsibility. Efforts to remove the friction arising from this cause prove unavailing if the correct diagnosis is not made. Too often a change in organization merely shifts the point of contact so that the fundamental trouble may break forth in new places.

The difficulties of the Washburn Machinery Company in its receiving department indicate the existence of this situation.

The Washburn Company

The head storekeeper of the Washburn Machinery Company had charge of several functions in addition to those of the storeroom. Stores records, through which all purchases went, whether or not they were held in the storeroom, were under his supervision. The receiving department, under the head storekeeper, inspected all incoming material as to quantity and quality. The personnel of that department at first included a special crew of four men for unloading freight-cars. The head storekeeper reported to the purchasing agent only when he discovered an error in the shipment. There was assigned to him one electric truck which did all the regular inside trucking work of the storeroom. When incoming material had been removed from freight-cars or vans to the receiving platform by the unloading crew, this truck was used by the receiving department to bring the material to its first destination in the

factory, which, in most cases, was the storeroom.

The purchasing agent, whose desk was beside the head storekeeper's, ordered only on requisitions issued by the latter, and handled all correspondence with the outside companies from which the material was purchased.

The traffic manager, in addition to his duties as director of traffic, had charge of the shipping department. The personnel of the shipping department included the crews necessary for loading outbound cars. The traffic manager had called attention to the fact that labor might be saved by consolidating under him the receiving department's unloading crew and his own shipping gangs. No action was taken on this suggestion until a complaint from the local agent of the railroad was received, stating that cars were held on demurrage unnecessarily. Investigation brought out the fact that the unloading crew had unloaded a recently arrived car in which there was a rush order badly needed by the factory, and had neglected a car previously spotted, containing goods for which there was no urgent or immediate need.

Combined Loading and Unloading Crews Under Traffic Department

As a result of this incident the traffic manager's suggestion was carried out. The receiving crew was detached from the receiving department and consolidated with the shipping department gang.

Previous to this step the traffic manager had transferred his responsibility over incoming material to the head storekeeper when the car was spotted. After this change, which placed on the traffic manager the responsibility of unloading material, the point of transfer of responsibility was delayed until incoming goods were delivered to the receiving room.

The pooling of the loading and unloading crews under a single head should result in flexibility and economies, but the particular demurrage difficulty might have been overcome by the use of an average demurrage agreement with the railroad company. The general effect of such an agreement would be that the company would have paid net demurrage charges for the month. Thus, if the free time were two days, the company would be credited for all cars released in less than two days, and charged for cars held longer. At the end of the month it would pay only the net charges. If, however, the net charge was a credit to the consignee, the railroad company would not make a refund nor would the credit carry over to the next month.

Friction arose between the newly consolidated freight-handling crew and the receiving department, which claimed that the freight handlers were unloading material without regard for the priority desired. In addition, stock was being unloaded and placed in the receiving department without notification. In several instances, material that was badly needed was not discovered by the receiving clerks for several days after it had been placed in the receiving department.

Traffic Department in Control of Both Unloading Crew and Receiving Department

To correct the friction, the traffic manager suggested that he take over the entire receiving department, feeling that a change in organization was the solution of the difficulty. As a matter of fact, adoption of this suggestion

would aggravate rather than alleviate the sore spot. The extension of the duties of the traffic manager so as to include the receiving department would have encroached upon the functions of the head storekeeper who was charged with the control of incoming material after it had been unloaded. The receiving department must prepare and distribute storekeeping records. This involves an intimate tie-up with the storekeeping department. If the receiving room and the storeroom are separated, friction over the use of the truck will arise because of dual control. Either official might try to hold it for his own work at the expense of the other department.

While the question of who shall have charge of different departments depends to some extent upon personality, and while circumstances often arise to make it expedient for one man to have charge of two or more departments, nevertheless, departments whose functions require intimate interchange of work and cooperation should not be broken up. If the traffic manager is to be placed over the receiving room, he should also take over the entire department now under the storekeeper, rather than one part of it.

As the organization stood, the traffic manager's function logically ended when the goods were delivered to the receiving-room door and checked against the bill of lading. At this point the receiving department's duties began. The unloaded packages were checked as to quality and quantity against invoices, records were written up, and the goods were sent to their destination.

Organization Not a Substitute for Assumption and Transfer of Responsibility

The difficulty, therefore, did not arise from an illogical division of duties growing out of defects in the organization, but rather from a failure properly to assume and to transfer responsibility. If the scope of the traffic manager's responsibility under the second set-up were fully recognized, he would notify the head storekeeper when goods arrived, would comply in unloading so far as was feasible with a determined schedule of priority, and would finally secure a receipt from the receiving department for packages delivered into its hands. This receipt would be a notification and an evidence of the transfer and termination of the responsibility of the traffic manager, and of the beginning of the responsibility of the storekeeper. Such recognition and assumption of responsibility should remedy the present situation.

In a rather small factory such as that of the Washburn Machinery Company, with a single receiving and shipping department, a combined loading and unloading crew might seem to be the logical arrangement, and that organization should function satisfactorily in this case if responsibility were properly assumed and transferred.

ADDING A PRODUCT TO THE LINE

A MANUFACTURER is often confronted with the problem of deciding whether or not to add a new product to his existing line in order to satisfy an apparent demand. This demand may arise among customers, in which case the answer to the question of satisfying the demand will hinge on the production situation. If, however, the demand develops within the plant, the

question can be answered only after a consideration of the merchandising aspect. In any case the effect of the addition on the company's finances and labor force must not be overlooked.

The contrasting cases of the Hyde Rubber Company and the Kimber Company are presented in order to bring out some of the important production and merchandising problems which are to be considered before deciding to increase the line.

The Hyde Rubber Company

The Hyde Rubber Company was a conservative concern which had manufactured druggists' sundries since 1915. Its products were similar to those of the large rubber companies, with which competition was keen. In an effort to equip its salesmen with a complete line of goods to offer customers, it purchased several articles which it did not manufacture.

The Hyde Rubber Company had among its products different-sized hot-water bottles which sold at prices ranging from 86 cents to $1.12, wholesale, and $2 and $2.50, retail. Hot-water bottles, a main item in the rubber sundries market, retailed at prices which ranged from $1 to $3. In 1922 a demand was found to exist in the poorer districts of the cities for a cheaper bottle which could be sold at wholesale for 50 cents, and at retail for $1. Naturally, the profit on this cheap bottle was small. Customers of the Hyde Rubber Company were embarrassed by the fact that in order to complete their stock they were forced to resort to competitors for this low-profit article, whereas they had no desire to shift their purchase of other articles included among Hyde products. The addition of a cheap bottle to the Hyde line would assist in the retention of old customers and in the acquisition of new ones. Increased sales per customer with the cheap hot-water bottle should reduce the percentage of total selling costs.

The danger that the low-grade product might ruin the Hyde Rubber Company's reputation for high quality could be obviated by not putting the company's trade-mark on the cheap article.

From a production standpoint there was sufficient extra floor space in the factory to permit the installation of new equipment required, and little additional capital would be needed to finance the proposed development. Manufacture of this cheap bottle would permit such important changes in production as the use of less skilled labor, the employment of a cheaper compound, and the utilization of a thinner mold requiring less material to fill it. Although estimates did not indicate that a good bottle could be produced for sale to wholesalers for 50 cents, the Hyde Company believed that it could make a bottle at that price which would compare favorably with that manufactured by competitors. Accordingly, it was giving serious consideration to the possibility of adding the proposed product to its line.

The Kimber Company[1]

The Kimber Company was one of the pioneer manufacturers of electrical appliances. By 1912 its line had become expanded by the addition of special models and novelty devices until over 1,000 items were listed in the catalog. In 1913 an analysis of its sales record resulted in the elimination of 800 items. This simplification caused a reduction in

[1] Used by the courtesy of Professor Melvin T. Copeland, *Problems in Marketing*, A. W. Shaw Company, Chicago, 1923, p. 442.

costs and a 20% increase in sales for that year. During the next four years further eliminations were made, and each year the sales showed approximately a 10% increase. In 1917 and 1918 practically the entire plant was devoted to war orders. When normal production was resumed early in 1919, the line was reduced to five standard electrical articles—flat irons, warming pads, hot plates, ranges, and radiators. Each of these articles was offered in about five sizes or styles. Sales during 1919-1920 increased satisfactorily, but in 1921 fell off 20% as a result of the general business depression.

The Kimber Company and its chief competitors made a practice of granting special preference, including an inside discount, to one or two wholesalers in each city. In return, the wholesaler featured and pushed the sale of the manufacturer's line. Electric percolators had been in that part of the Kimber line which was discontinued in 1915. In 1922 the question of a reinstatement of percolators in the line was considered by the company. Kimber customers who desired to carry percolators were unable to secure preferential treatment on them without shifting to the entire line of a competitor who handled these articles. The addition of the percolator to the Kimber line should, by increasing volume of sales, reduce the percentage of selling expense and assist the company in retaining customers. On the other hand, because the design of percolators is constantly changing, it would mean the introduction of a goods with a style element to a line hitherto limited to standard products.

The production of the existing Kimber line was highly perfected, and additional articles requiring a similar process could be made efficiently. Percolators, however, would require the use of elaborate dies and expensive machines which would have to be procured for the purpose. Furthermore, percolators contain a style element which would mean constant obsolescence of tools and dies, as well as stocks of finished and semifinished material on hand. The style element would also require the employment of a skilled designer, and this added cost for a single product would be expensive.

In the electric-appliance field the Kimber Company, as is indicated later in this discussion, is competing with producers who have concentrated on particular lines in the field. The economies of simplified production of appliances have enabled these producers to cut their costs to a point which the Kimber Company cannot reach.

It was decided not to add percolators to the Kimber line in the belief that the lower prices at which the company could put out its simplified assortment would be more attractive to the wholesaler than the benefits to be derived from having in the line one more of the many articles now lacking.

Marketing Contrast

A consideration of them from a marketing standpoint indicates clearly a distinct contrast between these two cases. Many large rubber concerns produce a full line of goods. Whether a full-line argument is of significance in merchandising goods in a certain trade depends upon whether any manufacturer has become large enough to supply practically all the various articles sold in that trade. By having a full line the manufacturer is in a position to retain his old customers and gain new ones, and thus to protect himself against competition. By being able to supply as many needs of his customers as possible,

a manufacturer offers to them the advantage of convenience in purchase and the relief from the necessity of going to competitors for but a small portion of their purchases. At the same time competitors of the manufacturers have no entering wedge with which to gain access to the customers and, perhaps, to cut in on the sales of products other than the one in question.

The full-line argument is a valid factor in the rubber goods industry, for many large concerns produce full lines. Such an argument is not, however, valid in the field of electrical appliances for no such clear-cut line exists. In fact, the latter is now a specialized field, and consequently the wholesalers and retailers are compelled to depend on a number of manufacturers in order to secure a reasonably complete assortment. If, therefore, one producer tried to manufacture the whole line, he would find that in competition with specialists his costs were increased and his selling problems greatly complicated.

In the one case, then, the Hyde Rubber Company should meet full-line competitors on the entire front, whereas the Kimber Company may expect to continue to supply its wholesalers as one of their several specialists, resting its appeal on the price and quality of its narrow list as well as on the service rendered.

Production Contrast

The Hyde Rubber Company was considering the manufacture of an additional article for which its plant was already adapted, while the Kimber Company was considering the manufacture of an additional product, only a small part of which could be made with existing equipment. Additional and different personnel and equipment would be required for the remainder.

Cheap hot-water bottles offer the Hyde Company possible production economies through the more complete utilization of the plant space and of the productive organization, the use of scrap, and the opportunity to level production, whereas percolators would load the existing efficient production unit of the Kimber Company with an unrelated side-line whose net effect would be to raise all production costs.

LEGAL DEVELOPMENTS SIGNIFICANT IN BUSINESS[1]

THE UNITED STATES ARBITRATION LAW

THE United States Arbitration Law, which becomes effective January 1, 1926, has been hailed by business men and lawyers as an important step in the correlation of business practice and judicial procedure. The Committee on Commerce, Trade, and Commercial Law of the American Bar Association states as its belief that "no piece of commercial legislation, no enactment at the request of lawyers has been passed by Congress in a quarter of a century comparable in value to this." [2] From business men come such utterances as that made by the president of the New York State Chamber of Commerce, "The bill is one of the most far-reaching pieces of legislation that has been introduced in recent years in the interest of sound business practice." [3] It is the purpose of the following article to inquire into the nature and significance of this act from a business rather than a legal standpoint.

Scope

The purpose of the act, as stated in the text, is ".... to make valid and enforceable written provisions or agreements for arbitration of disputes arising out of contracts, maritime transactions, or commerce among the states or territories or with foreign nations."

It is obvious that the scope of the act had to be limited to such cases as Congress had power to refer to the Federal Courts. Accordingly, the authors of the act saw fit to extend its operation in the first instance to contracts relating to maritime transactions or involving interstate commerce. By Article 1, Section 8 of the Constitution of the United States, Congress is given power "to regulate commerce with foreign nations and among the several states."

As with other provisions of the constitution this power has been subject to endless judicial interpretation. Overlooking some of the finer distinctions, interstate commerce may be defined as "a dealing in articles of commerce between states, by its citizens or others, and carried on in more than one state." Maritime transactions are harder to define; their legal limits being dependent upon historical considerations rather than upon logical analysis. In general, they have been defined as transactions "pertaining to the sea or ocean or the navigation thereof, or to commerce conducted by navigation of the sea or, in America, of the Great Lakes and rivers; an act which contributes to the

[1] Editor's Note: This department, which was prepared by the 1924-1925 Student Editorial Board, but could not be included in the October number because of lack of space, is a new one which makes its first appearance with this issue of the REVIEW. In it an attempt will be made to bring out from time to time the significance of some of the business problems involved in certain current legislative acts and court decisions. In commenting upon these, a business rather than a legal view-point will be taken, the latter task being left to the law journals. In the preparation of this article much assistance was given by Professor Nathan Isaacs, and this the writers wish to acknowledge.

[2] *American Bar Association Journal*, March, 1925, p. 153.

[3] *Ibid.*

navigation of a vessel presently or prospectively." [4]

In addition, Federal Courts are given jurisdiction to enforce arbitration agreements in cases in which, under the Judicial Code, the Federal Courts normally would have jurisdiction of the controversy between the parties. By Article 3 of the Constitution of the United States, the judicial power of the United States is made to extend "to all cases in law and equity arising under this constitution, the laws of the United States," and "to all cases of admiralty and maritime jurisdiction." Thus, this provision touches not only cases of interstate and maritime commerce, but also other cases in which there is diversity of citizenship, provided, in accordance with an act of Congress, the amount in controversy exceeds $3,000. It furthermore includes cases involving such federal questions as those arising under the Constitution of the United States, under treaties, under general acts of Congress, and particularly in regard to patents, copyrights, trade-marks, public lands, bankruptcy, national banks, and perhaps a score of other special topics, more or less clearly defined as "federal questions."

It will be seen, therefore, that the act, though comprehensive, leaves untouched vast numbers of every-day contracts and controversies. Intrastate contracts as such are not included. Within the fields of interstate commerce and maritime affairs, employment contracts of seamen, railroad employees and other workers in foreign and interstate commerce are specifically excluded because of the application of special legislation to these fields. As to non-commercial controversies, it is sufficient to note that the vast majority of them have nothing to do with federal questions, and where diversity of citizenship is involved the three-thousand-dollar limit excludes a large number of the cases that ordinarily might be submitted to arbitration.

The new act, therefore, does not extend in any way the jurisdiction of the Federal Courts, but rather makes arbitration agreements valid and enforceable within their present jurisdiction. It may be summarized briefly under the following heads:

1. The agreement to arbitrate must be made in writing prior to the dispute, unless both parties agree to arbitration subsequent to the dispute.
2. The dispute must be one that comes under the jurisdiction of the Federal Courts, either
   (a) arising out of interstate, maritime, or foreign commerce, or having to do with
   (b) a federal question, or
   (c) a dispute between citizens of different states, provided the amount in question is over $3,000.

Procedure

In those cases where suit already has been brought in a Federal Court upon a contract containing an agreement to arbitrate, the court, after having determined that the question is referable to arbitration and upon the application of one of the parties, will stay the trial or the action until there has been an attempt to arbitrate. In cases where suit has not been brought, any party to the contract who has access to the Federal Court may petition the court to enforce the obligation of the arbitration clause.

The force of the award of the arbitrators is to be the same as that of the court, and is to be executed in a like manner. The arbitrators in conducting their hearings may summon witnesses in the same manner as the courts, and en-

[4] 26 *Corpus Juris*, 741.

force these summons by contempt proceedings if necessary.

The agreement to arbitrate is valid, enforceable, and irrevocable, except on such grounds as exist in law and equity for the revocation of any contract. The award of the arbitrators may be vacated or set aside on the application of either party if it is shown, (1) that the award was secured through fraud, corruption, or undue means; (2) that there was evident partiality or corruption of the arbitrators; (3) that the arbitrators were guilty of misconduct, refusal to postpone hearing, refusal to hear pertinent and material evidence—or other injudicious behavior resulting in prejudice to the rights of the parties; (4) or that the arbitrators have exceeded their powers, or executed them so imperfectly that a material, final, and definite award was not made.

The court may modify the award if (1) there is evident material miscalculation of figures, or evident material mistake in the description of any person, thing, or property pertinent to the award; (2) the arbitrators have awarded upon a matter not submitted to them and such award has had a material effect on the case; (3) the award is imperfect in matter of form but not of content.

History of Arbitration

Arbitration as a method of settling disputes is an institution of long standing. In England it was a recognized practice within the guild organizations as early as the thirteenth century. In this country it dates back to 1647, when there was established a court of arbitration in the town of New Amsterdam. Since the beginning of arbitration three rather distinct changes in the attitude of the courts are to be observed. Prior to about 1900 it was a generally accepted principle of law that agreements to arbitrate were unenforceable and could be revoked at will by either party.[5] Early in the present century, the courts became more tolerant toward arbitration and it became the legal concept that a contract to arbitrate was valid as long as it did not specifically oust the court of its jurisdiction.[6] The most recent development has been legislative action to make arbitration enforceable. In the past few years several states have adopted laws recognizing and making valid agreements to arbitrate and giving the awards of the arbitrators the same standing as the findings of the courts. Such laws have been passed in New York, New Jersey, Illinois, and Oregon, and similar laws are pending before the legisla-

[5] The position of the courts was the result of the doctrine of revocability laid down in the Vynior case by Lord Coke in 1609. This dictum and the decision immediately following it apparently arose from the jealousy of the courts toward any institution which might restrict the scope of their jurisdiction. Rosenbaum, in his "Study of Commercial Arbitration in England," published in *Bulletin XII, American Judicature Society*, p. 19, explains this jealousy thus: "In the early days judges, as well as other court officers, were paid by fees on the volume of business that came to them, and being only human, they looked with disfavor upon any limitations of their power. It is easy to appreciate the psychology of the legal maxim, 'The office of a good judge is to extend his jurisdiction.'"

[6] In *Commercial Arbitration and the Law*, p. 15, Julius Henry Cohen says, "So that we may conclude upon this examination of the subject that, just as it is the duty of the Bar to dispose of controversy amicably, without resort to the courts, it is at this date an accepted doctrine of the common law that efforts honestly made by parties seeking to settle their differences out of court are to be encouraged and enforced by the court; and that whatever may have been the influences affecting a different procedure in the past, in this day there is no disposition to guard with any jealousy 'the jurisdiction of the courts.' In a footnote to *Corpus Juris* (Vol. V, p. 53, note 12*a*), the rule of revocation is called 'a highly technical rule, and the enforcement of it against the purposes of parties who have sought a settlement of their disputes out of court by a tribunal of their own choosing has sometimes provoked protest from common law judges.'"

tures of several other states. The culmination of this legislative recognition came with the passage of the act under discussion.

The rather slow development of arbitration in the United States may be attributed to the fact that business men did not come strongly to its support until within the last 20 years. With the growth of modern business, trade disputes have become not only more numerous, but also increasingly complex and difficult to understand and settle. The great increase in the number of disputes has proved embarrassing to the established courts of law, which are finding themselves swamped by an excess of litigation. Consequently, far-sighted lawyers and judges have sought some method of settling commercial disputes without bringing them into court. Arbitration appears to fulfil the requirements to a large extent.

Arguments for Arbitration

The following arguments have been set forth by the proponents of arbitration:

1. *Arbitration affords relief from the delay and formality of the courts.* Courts are greatly overcrowded, in some cases the calendars being full for the next four or five years. Obviously, under the dynamic conditions of modern business, such delay is highly undesirable. Not only is there delay before the case is heard, but the intricacies of the law make the actual hearing of the case a slow and costly process. Such strongly intrenched legal institutions as the "hearsay rule of evidence" and the "best evidence rule," although probably justifiable on legal grounds, throw many difficulties in the way of expeditious and effective business settlements.[7] Under arbitration, cases are decided as they arise, and procedure is more rapid and less costly.

2. *Arbitration allows the use of experts as judges.* Modern business has become an extremely complex mechanism. There is no longer direct contact between the manufacturer and consumer; rather, there is an intricate system of middlemen intervening. Customs differ as between trades, and what may be said to be fair in one case is unfair in a different situation. On the other hand, law has developed from ancient institutions and has been applied to this intricate modern mechanism. Injustice has resulted in many cases from the application of legal principles that fit the particular case in form but not in substance, or in some cases because of the ignorance of the courts concerning facts of business practice. What one writer has referred to as the "standard equipment" of the law was not made for, and in many instances does not fit, modern business institutions.[8]

3. *Arbitration assures justice for all regardless of financial strength.* Another result of the cumbersomeness of the law has been that corporations of great financial strength have been able to prolong legal struggles so as to dissipate the financial resources of their less wealthy opponents. Because arbitration is non-technical, the possibilities of such happenings are minimized.

4. *Arbitration is convenient.* Because of the informality of the arbitration tribunals it is possible to hold hearings at such times as best suit the convenience of the parties involved. This represents a great improvement

[7] For additional information see "Commercial Arbitration or Court Application of Common Law Rules of Marketing," by Wesley A. Sturges, *Yale Law Journal*, Vol. XXXIV, p. 480.

[8] *Ibid.*

over the hearings at law which are set with little or no regard to the convenience of the principals.

5. *Arbitration allows the principals to obtain such privacy as they may desire.* There are times when privacy is highly desirable from the standpoint of the principals and entirely consistent with sound policy.

6. *Arbitration fosters good-will between the parties.* As an instrument for better business feeling and understanding, arbitration presents very real possibilities. The result of a prolonged legal struggle is usually a feeling of unfriendliness between the parties involved. Where arbitration is used settlement is made quickly, and there is less chance for trickery when the parties meet face to face and discuss the points in dispute. The result frequently is better feeling between the principals.

In brief, these are the arguments that have been advanced for the use of arbitration as a means of settling commercial disputes. They are valid to a greater or lesser extent, according to the particular case under consideration and the type of legal machinery provided.

Arguments against Arbitration

There also are many valid arguments against arbitration:

1. *Arbitration as an institution is no stronger than the arbitrators appointed.* Arbitration is a more or less informal act according to its proponents. There is no formal court of arbitration. Rather, a different arbitrator is appointed for each case. Herein lies one of the weaknesses of the system. Since the arbitrator is appointed informally and only temporarily, he has no particular obligations to any one except the principals of the case, who usually are in the same business as the arbitrator himself. There are many opportunities for the unscrupulous arbitrator, who is more desirous of furthering his own interests than of giving justice, to make unfair decisions or to effect compromises in such a manner as to defeat justice. The strength or weakness of the system, therefore, lies in the type of arbitrators selected.

2. *Arbitration does not eliminate the possibilities of delay and trickery.* In order to safeguard the principals under an arbitration act, it is necessary to allow them the same defense against fraud that is found in the law. They are able to appeal their cases to the courts of law upon various grounds. The result of this is to lay arbitration open to many of the same dangers of delay and trickery that the law affords. Thus, unless the arbitrators desire a fair settlement of the dispute, there may be as much danger of their hiding behind the skirts of the law as under the present system.

3. *There are questions on which arbitration courts are not competent to pass judgment.* Another very fair criticism under present conditions is that arbitration courts are likely to pass on points which they are not capable of judging. In most cases there has been little attempt to define and limit the scope of arbitration. The place of this instrument may be determined best by considering the types of cases that are likely to arise. They may be classified conveniently under three headings:

(*a*) Questions of fact. Many industrial and trade disputes involve questions of pure fact that may best be determined by judges familiar with the practices and technicalities of the particular trade. These types of questions courts of arbitration are eminently fitted to handle.

(*b*) Many questions arising out of

trade contracts are questions of law. In some cases where the primary question is not one of law there are minor questions that must be settled on a legal basis. In such cases the judgment of legal experts is demanded and pure arbitration should not be used.

(*c*) There is a final classification of disputes, hinging upon questions of fact, that are indeterminate, and concerning which inferences must be drawn to determine the facts for a basis of settlement. It is not plain which type of settlement would be the most effective in such cases. On the one hand, there is the argument that the courts of law are used to handling such cases, and hence are better prepared to handle them. On the other hand, there is the argument that a tribunal composed of experts will know best what are the usual circumstances in such a case and hence will be able to build up the facts for the case at hand. Without trying to determine which of these claims is correct, it seems from the surface at least that justice will be as well served in such cases adjudicated by an arbitration tribunal as a court of law.

Of the three types of cases cited above it is obvious that one cannot be treated by arbitrators. If it were possible to draw a definite line and state which cases would call for decision on legal and which on factual principles, then there would be no argument against arbitration on this score. Such differentiation is impossible, however, for there are many cases of fact that in reality hinge on the law and where the arbitrators, in their ignorance of the law, are liable to defeat justice.

4. *Arbitration may be forced on small operators.* There is another argument against the use of arbitration clauses. In the great majority of routine cases the clauses relating to arbitration will be placed in the form contracts with the other minor clauses in the very small type. The opponents of arbitration argue, therefore, that many small operators unwittingly will agree to arbitration when if they had any option they would not favor such action. This argument, although probably true in some respects, apparently does not carry much weight, for the mere fact that a clause is in small print is not an excuse for ignorance of its content. Furthermore, it is not apparent that the small operators do not want arbitration or that they will not secure justice under it.

These, in brief, are the arguments for and against arbitration. While it is not within the scope of the present article to judge the validity of these arguments, it is necessary that they be borne in mind while discussing the Federal Arbitration Act.

Effectiveness of the Law

In commenting upon the effectiveness of the United States Arbitration Law there is no desire or attempt to enter into a discussion of the purely legal phases. It is hoped, however, that in a general way these provisions can be interpreted so as to make possible a non-legal evaluation of their effectiveness.

It is quite obvious that the real test of the effectiveness of any instrument is the efficiency with which it accomplishes the task for which it is designed. Since the Federal Law does not go into effect until January 1, 1926, any evaluation on this basis is impossible. A guess may be hazarded as to the possible success of the law, however, judging from the past success of the New York and New Jersey laws upon which the federal law is based. These states report the new laws to be functioning very efficiently,

that matters are settled expeditiously, and that there are only a few cases where appeal from the award of the arbitrators has been made. The secretary of the Committee on Arbitration of the New York Chamber of Commerce goes even further and states: "Our experience with the arbitration of claims has been a rather curious one. It is that the arbitration clause not only prevents litigation but also arbitration, and as such it represents a remedy that works both ways satisfactorily—preventive as well as curative. This experience has been duplicated by the Manchester (England) Chamber of Commerce." [9] In so far as the experience of these two states is a criterion, the machinery of the new federal statute seems to be generally effective.

The new law is sufficiently definite to be practical. It states that agreements to arbitrate "shall be valid, irrevocable and enforceable," [10] that judgments of arbitration tribunals "shall have the same force and effect, in all respects as . . . . a judgment in an action; and it may be enforced as if it had been rendered in an action in the court in which it is entered." [11] In order to give arbitrators sufficient authority to carry out their functions effectively it is provided "that the arbitrators . . . . may summon in writing any person to attend before them or any of them as a witness," [12] and that in case of the refusal of any of the persons so summoned to testify, the arbitrators by application to the United States Court ". . . . may compel the attendance of such person or persons . . . . or punish said person or persons for contempt. . . ." [13] There apparently is no criticism on the ground that the arbitrators are not given sufficient power to act effectively.

It is perhaps unfortunate that the original provision that controversies concerning so-called Federal questions, that is, disputes other than those arising out of interstate, foreign, or maritime transactions, involving less than $3,000 were nevertheless justiciable, was omitted by the Senate in the final passage of the bill. Through this omission the scope, if not the effectiveness, of the bill was curtailed.

One of the points of strength in the new act lies in the fact that while it is sufficiently definite to accomplish its purpose, it makes no attempt to overthrow or dictate to the usual processes of the law. There are several instances where this policy is evident. In admiralty cases there is no attempt to stay the libel and seizure processes for arbitration.[14] Thus, there is no opportunity for the unscrupulous merchant to invoke the arbitration law as a method of staying the libel proceedings and possibly saving property that would otherwise be seized. The other outstanding example of this policy is the method used in selecting arbitrators. The law does not dictate how they shall be selected or the number, unless the parties to the contract are in default in selecting the arbitrators, and then the law lays down in the most general manner the methods to be followed. This freedom from restraint apparently does not interfere with the effectiveness of the law; and it undoubtedly appeals to the business man and encourages him to avail himself of the statute.

[9] "Commercial Arbitration or Court Application of Common Law Rules of Marketing," Wesley A. Sturges, *Yale Law Journal*, Vol. XXXIV, p. 494.

[10] United States Arbitration Act Public No. 401, 68th Congress, Sec. 2.

[11] *Ibid.*, Sec. 13.

[12] *Ibid.*, Sec. 7.

[13] *Ibid.*, Sec. 7.

[14] *Ibid.*, Sec. 8.

Although the Arbitration Act does not assume a dictatorial air, and although it allows the greatest freedom of movement possible, it does not set aside or eliminate the legal rights and safeguards that are the common heritage under the Anglo-American law. It states that an agreement to arbitrate is ". . . . valid, irrevocable, and enforceable, save upon such grounds as exist at law or in equity for the revocation of any contract." [15] The parties to the contract are protected against irregularities in the making of the contract or the failure to proceed with arbitration by the provision that if the court is satisfied that the making of the agreement for arbitration or the failure to comply therewith is not in issue it shall make an order directing the parties of the agreement to proceed to arbitration.[16] The parties to the contract have the right to appeal to the courts from the award on several grounds that have already been stated. In the statement of the appeals there is an evident attempt to be as specific as possible, in order to eliminate the possibility of appealing as a purely dilatory measure, and at the same time to be sufficiently general so that the parties will be given adequate protection. The final safeguard that is provided is the power given the courts to modify or correct the award in certain cases where the effect of the award is not in question, but rather where there has been some inaccuracy that might be inimical to justice or jeopardize the effectiveness of the award. This provision seems to afford an effective safeguard against inaccuracies, and at the same time remove many of the sources of dispute and possible litigation.

In view of the rather elaborate protective measures explained above, the question may well be raised if these restrictions do not defeat the purpose of the act by supplying increased possibilities of litigation and the resulting legal delay that arbitration is supposed to eliminate. In so far as can be determined, this does not appear to be a real danger. In the case where the making of the agreement or the default of one of the parties is in issue, it is provided that the court proceed summarily to the trial of the case.[17] Thus, the usual delay because of crowded dockets is eliminated. Finally, a time limit of three months from the date of the award is set, after which it is not possible to institute an action to vacate, modify, or correct the award.[18] This assures that action on a case will be continuous and that dilatory tactics probably will be minimized. It must be admitted that notwithstanding these time limits and the definite terms of the act defining the right to appeal, there is some possibility that a dishonest and unscrupulous party can delay the action of justice by taking advantage of the safeguarding provisions. It is doubtful, however, if these provisions could be made without this possibility, and there can be little argument that such provisions are entirely necessary. The act, therefore, cannot be severely criticized in this regard. In general, therefore, it seems fair to say that the United States Arbitration Act is an effective mechanism for directing and carrying on commercial arbitration.

Dangers That May Be Encountered

Without attempting to indicate the legal pitfalls that such a law as the Federal Arbitration Act may contain, it

[15] *Ibid.*, Sec. 2
[16] *Ibid.*, Sec. 4.
[17] *Ibid.*, Sec. 4.
[18] *Ibid.*, Sec. 12.

may be beneficial to point out several of the more obvious situations that should be guarded against. The awards of arbitration boards are not enforceable in all countries. Thus, in disputes arising out of foreign trade it is entirely possible that a merchant in this country may agree to arbitrate with a merchant in another country whose laws and courts do not recognize arbitration. It is quite obvious that this might result unfairly because the merchant in this country would be bound by the awards of the arbitrators although the merchant of the other country would not be so bound, and might be able to evade the law. Two steps probably should be taken to guard against this state of affairs. In the first place, parties to foreign commerce should investigate the legal status of arbitration in those countries with which they have dealings. In the second place, more general steps should be taken by the government of this country in negotiating treaties with the foreign countries under which arbitration awards would have equal standing with that which they have in this country.

Finally, there must be no thought of arbitration as a purely automatic instrument of justice. It quite obviously is no stronger than the arbitrators themselves. It should be the concern of parties in arbitration agreements, therefore, not to select arbitrators that are favorable to them as firms or individuals, but rather to obtain the highest caliber men of the industry to act in this very important capacity.

Conclusion

The general desirability of the act may be measured by its effect from the standpoint of good business policy. The question may be asked "does this law represent a step in the direction of sound business practice?" The answer apparently is that it does. Arbitration as a means of settling disputes is a more flexible tool than litigation. It is more expeditious, cheaper, better able to adapt itself to the rapidly changing customs and practices of business, and it promotes better feeling between the disputants. It unquestionably has its faults and is not to be regarded as a panacea. There are chances for the use of dilatory and unfair tactics. It is possible for the arbitrators to infringe on territory that is plainly that of the law courts. None of these objections, however, appears fundamental or impossible of correction. The act seems to be unfortunately limited in scope and probably not of great use to the small local business man, but for those cases that it does cover it is apparently an effective instrument.

A significant feature of the passage of the Federal Arbitration Act arises from the active support given it by the American Bar Association. This, along with several other similar instances, indicates a growing tendency for the legal profession to recognize the limits of the law and to supplement it so as to serve the exigencies of modern business. The most important aspect of the passage of the act, however, does not appear to be in its direct application. Rather, it consists in the impetus that such an act is bound to give to state legislation of this type. Other laws have evolved through the cycle of state, federal, and uniform state legislation. There is now in preparation a Uniform Arbitration Law that will receive nation-wide consideration and probably acceptance. While the new law does not directly touch the small business, it does promise developments which may make arbitration an instrument of general use.

REVIEWS OF BUSINESS LITERATURE

Feldman, H. THE REGULARIZATION OF EMPLOYMENT. *New York: Harper & Brothers, 1925. 437 pp. $3.50.*

UNEMPLOYMENT, as one of the ills of the modern industrial order, has received the attention of business executives, labor leaders, economists, and social workers for many years. As Mr. Feldman points out, it is only recently, however, that the problem has been recognized in its proper form, the relative security of employment. This is entirely different from the question upon which attention formerly was focused, the relative amount of unemployment. In the past, governmental and social organizations have proposed relief, which is a palliative, but not a cure; at the present time, attention is being directed to curative, rather than remedial, measures. In the author's opinion, the distinctive American contribution to the subject is the belief, supported by experience, that improved industrial technique will regularize production throughout the year and throughout the business cycle.

The central theme of this book is the prevention of unemployment through the provision of regular work in industry. The social and industrial effects of irregular employment are grouped into three classes: effects, both mental and physical, upon the wage-earner; effects upon business, such as increased overhead, increased labor cost, restriction of output, impairment of skill, and cost of labor turnover; and burdens borne by the consumer in the form of shortages in supply and higher prices.

The author points out that the instrumentalities for the immediate attack upon the problem are in the hands of industrial and business executives. The avenue of approach is statistical research, and its results can first be applied to distribution technique and policies in estimating future demand, analyzing seasonal demand, developing off-season outlets, and forecasting cyclical depressions and overcoming their defects. Diversification of output by means of side-lines and "fillers" is possible in many businesses and is suggested as a logical part of distribution policy. Simplification, or the reduction of the number of variations in a line of products, which has been the subject of much study by various trade associations under the leadership of Secretary of Commerce Hoover, is strongly recommended. Mr. Feldman recognizes, however, that in many style-bound industries, such as the shoe industry and the women's garment trade, there are special difficulties, but he believes that the present tendency to encourage variety in styles might well be curbed. The experience of many firms is given to show the possibility of changing customary purchasing habits by inducing customers to buy more regularly, by securing orders earlier from dealers, and by establishing special retail outlets. The summation of these policies the author expresses in the term "distribution engineering," which involves the preparation of long-range plans of business expansion, the formulation of an annual sales plan, and the coordination of the two.

Mr. Feldman recognizes that production, as well as sales, must be planned if the desired results are to be secured, and that complete coordination can be obtained only through the

application of the technique of scientific management and the formulation of master plans which govern the activities of all phases of a business. With these methods, in his opinion, labor policies that tend to regularize employment, such as the planning of labor requirements and the careful, considerate handling of the problems of hiring, transfer, and discharge by a central personnel department, must also be established.

The author's conclusion is that the eradication of the evil of irregular employment cannot be effected by the managers of industry alone. Social and governmental agencies must be developed to supplement the work done in shops and factories. The establishment of a system of employment exchanges has been recommended in almost every study of the problem, but it is Mr. Feldman's opinion that such agencies can be fully effective only when industry has made its contribution to the solution. The importance of having the complete cooperation of labor and labor organizations is obvious, and there is ample evidence that such support will be quickly forthcoming because of labor's vital interest in the question. The author believes that the great majority of employers view the subject of unemployment compensation and insurance with unjustified alarm. Although this form of insurance is still in the early stages of its development, the increasingly satisfactory results which are being obtained by several representative firms are cited as an indication that its use and importance will develop further. It is pointed out that a comprehensive program of regularization must also include the long-range planning of public works and of public utility expansion and improvement, as well as putting brakes on the business cycle. It is emphasized, however, that the stabilization of each individual business provides the most favorable approach to the control of the business cycle and that there is a place for all groups in the program.

In this book, which is published under the auspices of the American Management Association, Mr. Feldman has made a valuable contribution to the solution of one of the major problems of industry, the regularization of production and employment. His work in accumulating the plans used by business men in attacking the problem has been very thorough. In many instances, this material was furnished by executives of the companies using it and is published here for the first time. In the several cases in which the writer was permitted to engage in research and study in the offices of firms, the material is especially well-rounded and complete. The greater part of the illustrative material, however, has been taken from articles by business executives in various periodicals.

The proposals advanced by the author are economically sane and constructive. Discussion is not limited to the abstract generalities of the subject; on the contrary, each phase is supported with specific examples of manufacturing and selling methods which have been used successfully by various firms in attacking the problem. The important fact that plans which will work in one industry may not be applicable to another is well recognized. The work is in no sense a handbook to which the executive can turn to find a ready-made plan for his business. The alert executive will find it, however, a valuable source of stimulating suggestions which will throw new light on the problem of irregular operation and employment in his particular business; an intelligent study of the book will

yield practical hints for economies and improvements in operating methods.

Hackett, J. D. HEALTH MAINTENANCE IN INDUSTRY. *Chicago: A. W. Shaw Company, 1925. 488 pp. $6.*

THE workman's ability to labor may be said to represent his capital, and anything which interferes with his use of that capital is undesirable. It has long been recognized that industrial accidents interfere with and destroy this ability to work, and steps have been taken to eliminate this industrial waste, but the more subtle influences which undermine and wreck the health of the worker have not been given as much thought or attention. Mr. Hackett, in *Health Maintenance in Industry,* has endeavored "to show those who manage plants, and are, therefore, responsible for the management of medical departments, how the worker's health may be maintained and improved as a means of increasing production."

Plant managers are often unaware of the loss of output due to sickness among their employees, and even if aware of it they hesitate to undertake the burden of improving health conditions. The author has presented evidence as to the costs of good health service for plants of various sizes, which show how, in the final analysis, it is a benefit rather than a burden to the employer.

After discussing industrial mortality, the need for industrial hygiene, and the place of medical service in the plant in the first section of the book, Part II is devoted to the consideration of "The Medical Department." This section appears to be the most valuable one in the book. Detailed suggestions are given for the institution and layout of a dispensary with a description of the medical duties to be centered there. In contrast to the curative measures which must be adopted after the employee is sick, the author stresses the importance of using preventive measures to keep the employees well. The selection of the right man for each job is one factor which helps to prevent sickness and inefficiency, and this is to be accomplished by physical examinations at, or soon after, the time of employment.

The layout and equipment needed for a surgical room are outlined in the next section. This subject is briefly treated, however, as it is an older field of plant activity about which much has been written.

One section of the book deals with "Plant Hygiene" as a contributing factor to health maintenance. The prevention of industrial fatigue and disease through the agencies of "Heating and Lighting," "Ventilation," "Lunch Rooms," and "Rest Periods and Seating" is given special attention. Fatigue of workers who are not sick is just beginning to receive proper attention as a type of industrial waste, and the author gives a classification of the principal mechanical and psychological causes of fatigue.

The final section of the book deals with "Plant Sanitation." This is not entirely new material for the industrial manager, but the latest ideas upon the subject are here brought to his attention. In his concluding chapter Mr. Hackett shows how inexpensive all of these devices for maintaining the health of the worker really are, and he also brings in the larger question of state health insurance, which will become a necessity unless plant managers protect their workmen. A large amount of statistical data relating to health maintenance has been gathered from a wide variety of sources and embodied in the book. These statistical references appear so

frequently that they may be somewhat tiresome for the general reader, but they are nevertheless valuable to the plant manager.

It seems that the chief value of this book lies in the emphasis placed upon the necessity of using preventive rather than curative measures in the field of industrial health maintenance. Hitherto, too much attention has been given to curing the injured or sick worker, and the health of those who are now well has been given little thought. The book is also valuable because of its comprehensiveness. Practically all aspects of this subject are fully covered; old ideas are brought up to date, and many new thoughts of value to the industrial manager are also presented. Throughout the book the author has taken a very practical point of view. He realizes that the preservation of the workers' health is desirable from a social standpoint, but that medical service will not be widely adopted by employers until it can be shown that it has an ultimate dollars-and-cents value.

The material of the book is general rather than technical; "medical and surgical aspects are dealt with only in so far as may be necessary to their understanding from the plant manager's point of view." It is a desirable book for any one who is interested in the conservation of the labor power of the country, and it should be of special interest and value to owners of industrial plants who are just contemplating the installation of a medical department.

Nash, L. R. THE ECONOMICS OF PUBLIC UTILITIES. *New York: McGraw-Hill Book Company, Incorporated, 1925. 430 pp. $4.*

THE subtitle is "A Reference Book for Investors, Engineers, and Students." Except for incidental reference to railroads, wired and wireless communication companies, the work is limited to a discussion of the problems of electric light and power, electric railway, and gas companies. The recent growth of these companies has been so great, the demand for new funds has been so insistent, and the operation of these companies has become such an intimate factor of nearly every one's life that the need for such a work is apparent to all who are desirous of keeping in touch with the times. It should be of particular value to public service commissioners and to individual investors who desire to learn of the methods by which the values of public utility securities may be measured.

The author begins with a brief historical review of the growth of public utilities, and of the recent tendencies towards consolidation and centralized control. The advantages to the public dependent upon the employment of a trained engineering staff, of specialists in financing and in conducting relations with public officials, as well as those resulting from large-scale purchasing, are well presented. An interesting exhibit shows the relative stability of the net incomes of public utility operating companies in comparison with those of industrial and mercantile establishments and railroads.

The subject of franchises is adequately discussed. The chapter on capitalization describes the typical structure and analyzes the factors affecting the classes of securities issued, and the amount of protection offered. The author explains the differences in the treatment of depreciation or retirements, between the accounting practice of electric and gas utilities as developed by state commissions, and that for electric railways initiated by the Interstate Com-

merce Commission. He favors flexibility in appropriations for retirements, to the end that stability in a dividend policy may be attained. He also recognizes the existing confusion and the lack of a satisfactory basis for comparison of the accounts of various companies. The various theories of depreciation as affecting valuation are further analyzed in the chapter on valuation.

The history and function of regulatory practice is described, with an explanation of the scope of the control properly exercised by such bodies, and of that which should be retained by the management. The author stresses the necessity of stimulating management by some arrangement such as the variable return. The effects of using the investment basis or the cost of reproduction, as the measure of value or the rate base, are elaborately discussed; and the importance of the overhead charges, such as the cost of establishing the business, the development costs, and like elements entering "going value," are well illustrated by citation of representative cases and the decisions thereon. The effect of variations in price levels is shown with a suggestion as to the possibility of measuring value in conventional dollars, based on the Commodity Prices of the Bureau of Labor Statistics. "The sacrifice made by the owners of the property" appears to be the proper basis on which to reconcile the conflicting views as to rate base determination, and also as to the investment return. Question is raised as to the feasibility of using certain "yardstick" appraisals, and the degree of accuracy possible of attainment thereby, without the expense of a detailed appraisal of the various units.

In the chapter entitled "Rate of Return to Investors," the author points out the importance of sustained credit, and the accumulation of a surplus, as a factor in the cost of new money. The discussion of the importance of the capitalization structure and its effect on the diminution of the risk factor will be found of interest. Emphatic recognition is given to the inability of commissions to fix the rate of return which public utility properties should earn. They are able to determine the permitted return. What should be permitted is determined by economic laws.

The justification of the various rate structures as a means of securing the maximum volume of business and of adjusting charges in proportion to benefits received is of interest to operators and consumers.

No book on this subject is complete without a chapter on public ownership. The author justifies public ownership only in the case of water supply companies where the ratio of capital charges to operating expenses is extremely high, and in certain minor utilities where the public to be served is too small to warrant the investment of private capital. There are few students of the operation of public utilities who will differ, for this opinion is widely held, but it is desirable to have the evidence substantiating such view at hand for the instruction of the uninformed.

The author concludes with a statement of the unsolved problems and with a hopeful view of their satisfactory solution. The book will be found valuable for reference. The style is readable and not dogmatic. Decisions of courts and regulatory bodies are freely quoted and the reasons for the decisions analyzed. It should be of material assistance in enabling business men to become conversant with the economic principles underlying the problems which present themselves to the public utility operator.

BOOK NOTICES

Brookings, Robert S. INDUSTRIAL OWNERSHIP. *New York: The Macmillan Company, 1925. 107 pp. $1.25.*

In this book Mr. Brookings discusses the present tendency toward the wide distribution of industrial ownership, and the new responsibility of management as trustee—responsible to the owners and to the public. He speaks of the relatively small return from capital invested in industry and of the need for increased per capita production. Looking upon management as a trustee, he suggests that it be subjected to penalties for the abuse of power only and not for the mere possession of it. Following this line of thought, he suggests modification of the anti-trust laws and of the restrictive practices of militant trade-unionism as desirable steps toward greater freedom of competitors to unite for the exchange of information and for cooperation in the public interest. He feels, furthermore, that it is especially important for labor to understand that the labor-public problem has supplanted the capital-labor problem, and that the exaction of more than a fair share by any one of the industrial groups injures all groups. Finally, the author suggests the necessity that management realize "its responsibility to secure for labor the largest return consistent with fairness to the public and a just return to stockholders." Among the duties of management, he finds that of reducing the violence of the disturbances caused by the business cycle and of guarding labor against such disturbances with their consequent evils of unemployment.

Clark, Horace F., and Chase, Frank A. ELEMENTS OF THE MODERN BUILDING AND LOAN ASSOCIATIONS. *New York: The Macmillan Company, 1925. 540 pp. $4.*

This book, an important contribution to the field of finance, is one of the very few on the subject of building and loan associations, and is the first to contain a survey of the entire field.

The authors have realized the growing interest of the public in these financial institutions, and have written the book in such a manner that it is equally comprehensible to all classes of people. They hoped, by so doing, not only to aid association officials in finding possible weak spots in their organizations, but also to enable the general public to recognize the great value of these institutions. The result of their efforts will be of particular importance to those who wish to become effective workers in this field which is as yet only partially developed.

The book is logical in its arrangement, starting with the nature of the associations and dealing with the problems encountered at each stage in the development of the business. The arrangement, however, is such that it is possible to obtain information concerning definite phases of the business without reading the whole book. This, of course, necessitates a certain amount of repetition of fundamental explanations, but gives the book great flexibility in its practical use.

The first part of the work explains the economic and financial principles underlying building and loan associations. After the different "plans" under which associations have been organized are discussed, the kinds of shares to be issued are given consideration.

The book passes from the problems concerning the formation of associations to those connected with conducting the affairs of the business, such as the choice and organization of the personnel, the sources of funds, and the general financial policies. The important problems related to the making and payment of loans are given thorough consideration. The descriptions of various systems of association accounting occupy an important position in the text, as does a discussion of methods of extending the business of an association. Consideration is also given to the different methods of solving problems which have proved successful in building and loan associations in the past.

Finally, the book explains in a clear manner the relationship of these institutions to their members and to the community as a whole. Their position in the financial organization of the country is also outlined. In conclusion, emphasis is given to the fact that these associations do not compete with other financial organizations, but fill a social need for which to the present time no provision has been made.

Crum, William Leonard, and Patton, Alson Currie. ECONOMIC STATISTICS. *Chicago: A. W. Shaw Company, 1925. 493 pp. $6.*

Business men who have been following some of the business forecasting services are beginning to inquire into the application of statistical methods to business. Among other things, they would like to know how statisticians are able to compare different series of data which, in their original form, seem incomparable. This new book by Professors Crum and Patton is the simplest and clearest exposition yet published of the mathematical methods commonly used by statisticians dealing with economic situations. The three parts of the book deal with the nature of statistical data, methods of general analysis, and methods of analysis of time series. The first and third parts are the most important for the average business man, and are the least difficult to follow. The book fails certainly in one respect, and that is, it does not make sufficiently plain to the reader that the judgment used in applying mathematical methods is at least as important and more difficult than the methods themselves.

Diemer, Hugo. FACTORY ORGANIZATION AND ADMINISTRATION (Fourth Edition). *New York: McGraw-Hill Book Company, Incorporated, 1925. 398 pp. $4.*

As the name implies, this publication covers every detail of production practice, factory organization and administration. The stated purpose of the book is one of service to officers of manufacturing corporations, works managers, superintendents, accountants, and the heads of such departments as purchasing, stores, personnel, cost, and production, who desire a comprehensive grasp of the problems treated. Accomplishment of the purpose is carried out by means of a brief statement, at least, of the many details relating to this vast subject. It is obvious that a volume of this size can do little more. The subject-matter, however, is supplemented by copious references to more complete treatments of its major phases. The final chapter, "A Bibliography of Works Management," contains a complete list of books from which detailed information may be obtained.

The original edition of this book was published in 1910. The tremendous advances which have taken place in the field of industrial management since that time have necessitated frequent revisions of the original text and this has been done in 1913, 1920, and finally in 1925. No additional chapters have been added to the fourth edition, but a few of the old ones have been entirely reorganized and brought up to date. The bibliography contained in the final chapter has been revised to include the more recent material published and eliminate that which has become obsolete.

Furniss, Edgar S., with the collaboration of Guild, Lawrence R. LABOR PROBLEMS. *Boston: Houghton Mifflin Company, 1925. 621 pp. $2.80.*

Although this book consists in large measure of excerpts from previously published material dealing with labor problems, the skill and judgment of the authors in selection and arrangement, and their own contributions render the whole more valuable than the sum of its parts. The contents have been judiciously selected and logically arranged for the study of the subject. While the authors claim no original contributions, they have succeeded in welding the existing material into a logical and coherent whole, divided into four groups: the problems of the industrial wage earner, as unemployment, wages, hours of labor, industrial accident; the organized labor movement and its economic, political, and social program; the agencies of industrial peace, as conciliation, mediation, and arbitration; and modern industrial relations policies, as profit and ownership sharing, and employee representation. The book is designed primarily for classroom purposes, but it will be of value to the executive who wishes to make a hasty survey of the whole field of labor problems and to grasp their economic and social significance.

Hauer, Roy, and Scragg, George H. BUS OPERATING PRACTICE. *New York: International Motor Company, 1925. 260 pp. $3.*

The operation of motor-bus lines is the latest and the most rapidly expanding method of providing passenger transportation in the urban, suburban, and interurban fields, and it has proved a formidable rival of the older and less mobile forms embodied in the railroad and the trolley-line.

The authors of this book have made a study of the practice in this field, and have

endeavored to draw from it some principles which will help to formulate the ideas of present and prospective operators. They show how, as is the case with all rapidly growing industries and services, bus operation has passed through a chaotic but yet formative stage; and how it is now perceived that the business has and should be granted the standing of a public utility, and should be subject to regulation by the communities it serves, whether municipalities or states. They discuss the technique of projection, inauguration, and operation, based on the true needs of the district and the possibility of securing an adequate return, which is being developed; and they demonstrate the necessity for providing a service which is at once safe, courteous, and efficient, not only as an end but also as a means of securing that good-will and cultivating that habit of travel which are particularly valuable to this service, where there is little possibility of monopoly and where, therefore, consideration of the personal factor is of primary importance.

Finally, the book illustrates the inevitable growth of the operating corporations in size and complexity, which brings a realization of the fact that only by close attention to methods and expenses can competition be met and a profit shown. As a result, reasoned investigation into such matters as the selection of equipment, the training of personnel, and the tabulation of costs becomes a recognized necessity; and the book indicates the topics to be covered and suggests methods of inquiry which have proved their usefulness in practice.

By reason of the newness of the subject, this volume is suggestive rather than finally authoritative in any sense; but it includes a fund of specific information, particularly on the subject of the requirements of state commissions, and it represents a definite contribution to the literature of a new service.

Herschel, Arthur Hobart. THE SELECTION AND CARE OF SOUND INVESTMENTS. *New York: The H. W. Wilson Company, 1925. 373 pp. $4.*

A large proportion of those who have accumulated some capital, particularly the large group of small investors, buy securities with no knowledge of the risks taken, and consequently jeopardize their savings. Any book whose purpose is to decrease the economic waste due to bad investments helps society and the individual, but the majority of books on the principles of investment fail, because of their complex treatment of the subject, to reach the individuals who need the knowledge most. In contrast with such books, *The Selection and Care of Sound Investments* unfolds its contents in a readable manner that should encourage those with the slightest interest to acquire a complete knowledge of the methods by which they can make their savings yield a good return with the minimum assumption of risk. The brief and clear-cut nature of the titles of the chapters and the headings of the paragraphs facilitate its use as a reference book. This treatise emphasizes the necessity of safety in investment rather than of maximum return by indicating the increase of risk attendant upon the enhancement of earnings. On the other hand, no contribution is made by this book to the general subject of finance, and a person interested only in the broader topics found in that field will not find it a profitable work to study.

Under the chapter headings, "Different Investments for Different People," "Selection of Reasonably Safe Investments," and "Attractive Securities," the first part of the book outlines the accepted fundamentals of making investments. The next few chapters, which discuss the various securities suitable for purchase, do not point out which types of securities are most adapted to particular classes of investors. The remaining chapters, however, give detailed information regarding the nature of stock dividends, stockholders' rights, bond yield, and the ways of recording investments.

In conclusion, it may be said that the chief merit of this book lies in its use as a handbook by the individual who wishes to gain a concrete knowledge that will assist him to make his investments in an intelligent manner.

Hoopingarner, Dwight Lowell. LABOR RELATIONS IN INDUSTRY. *Chicago: A. W. Shaw Company, 1925. 553 pp. $6.*

After giving his own point of view in approaching the problem of labor relations, Mr. Hoopingarner takes up in turn control of labor relations, division of earnings, working periods and labor supply, health conservation, special social considerations, focal plant relations, and world scope and trends. Because of the amount of ground he covers, the author seems to hit merely the high spots in many places where he might easily be justified in going

more deeply into the subject. The book is worth while for those people who wish to know what has been tried along many different lines and what dangers they might encounter in connection with certain phases of labor relations. At the same time the reader must beware of the fact that the author sometimes states as accepted doctrine conclusions of his own which are, to say the least, open to argument. Examples of this are to be found in the treatment of the relation of marketing to labor conditions and in a statement that wages should not be settled by relative bargaining power or by competition.

INDUSTRIAL COAL: Purchase, Delivery, and Storage. A Report of the American Engineering Council. *New York: The Ronald Press Company, 1925. 419 pp. $5.*

There is perhaps no industry in which irregular operation assumes such wide-spread importance as it does in the mining of coal. Not only is American industry vitally affected by the interruptions in the production of coal, but the American public as well is made to suffer through inability of the mines to produce sufficient coal or inability of the railroads to transport this coal during periods of peak consumption. In an effort to alleviate situations of this kind, the American Engineering Council, appointed by the United States Coal Commission, has made a thorough investigation, the results of which are published under the above title. This book comprises the reports of over 400 engineers, representing all the leading industrial centers in the United States. While the recommendation of the committee is simply that the consumer contract for his yearly supply of coal to be delivered in equal monthly instalments, the real value of the report is to be found in the discussions relating to deterioration, combustion, transportation, and storage. Toward the end, important facts are given concerning the storage facilities of the individual districts, based on the reports of competent engineers representing each locality. It must be recognized that this is an engineers' report subject to the technicalities involved in such an investigation, but it should prove of interest to those who are concerned with the production and purchase of industrial coal.

Jones, Eliot, and Vanderblue, Homer B., Editors. RAILROADS: Cases and Selections. *New York: The Macmillan Company, 1925. 882 pp. $4.25.*

This book, as its preface states, has been designed to provide illustrative material which might accompany the editors' other works on the subject of transportation. It consists, in large measure, of decisions of the Interstate Commerce Commission, of the Railroad Labor Board, and of the Supreme Court of the United States, together with critical and historical excerpts from various sources. The selections are presented by the editors without comment except for notes of an explanatory nature.

The material is grouped under seven heads —Development, Rates, Service, Finance, Combination, Labor, and the Conflict between State and Federal Authority. Hence it covers practically all of those topics in which the people, either individually as shippers or travelers, or collectively as a state or nation, have a vital interest. Upon such matters the people have gradually asserted their right to exercise authority, and these cases and selections show the evolution of this control and some of its implications.

This book, it is believed, is the first attempt to present a collection of case material on transportation which illustrates the economic and legal aspects. The outcome of this work is a volume of great concentration which, it is thought, will prove equally valuable to the student who needs material from which to formulate principles and to those in the business world who seek a careful and logical selection of information on a subject which is of vital importance to them.

Leffingwell, William H. OFFICE MANAGEMENT: Principles and Practice. *Chicago: A. W. Shaw Company, 1925. 850 pp. $7.50.*

Any addition to the meager literature on the subject of office management is to be welcomed. In this single volume the author has attempted to assemble a large amount of material with a number of purposes in mind. First, there is the problem of building up a theory of office management—dealing with principles, control, standards, and scientific analysis. With this theory established, the author next undertakes an analysis of the problems facing the office manager. The third and perhaps chief aim of the book is to set forth under the heading of "Standardization"

methods employed in handling the various phases of office work. In this section standardization of product, of equipment, of materials, of methods, and of personnel is considered in order. In the final section the author generalizes on the subject of "Control," touching measurement of performance, the setting of standards, the planning of work, wage-payment methods, and the office budget.

The entire consideration is developed against a background of scientific management. In spite of this fact, there is much material which should interest even those to whom the name of Frederick W. Taylor means little.

As a practical reference guide to modern office procedure, the book contains a fund of information the value of which will depend on the breadth of the reader's previous knowledge of office methods.

Metcalf, Henry C., Editor. LINKING SCIENCE AND INDUSTRY. *Baltimore: The Williams and Wilkins Company, 1925. 206 pp. $3.50.*

This book, one of a series dealing with the general subject of "Human Relations in Industry, Commerce, Government, and Education," is a compilation of 16 lectures delivered by prominent biologists, psychologists, labor leaders, and economists before a course for executives conducted by the Bureau of Personnel Administration in New York. Among the contributors are James Harvey Robinson, Harold G. Moulton, and Thomas Nixon Carver. The general purpose of the papers is to discover the contribution of the humanistic sciences to the art of business management. The limitation of time in the delivery of the lectures has resulted in brief, synoptic treatment in some instances and in sketchy and inadequate consideration in others. The papers are related to the general subject but not to each other, and, therefore, the book as a whole lacks unity. The defects of the book are those which usually result from such an attempt to bring together in one place the work of several persons. Because of the inherent limitations in the method, it is doubtful whether books of this kind constitute a valuable addition to business literature.

Paton, W. A. ACCOUNTING. *New York: The Macmillan Company, 1924. 894 pp. $3.50.*

In the preface of this book the author describes his aim as one to provide "a satisfactory text-book for an intensive first-year course in principles," and "an effort . . . . to make the treatment sufficiently comprehensive to meet the needs of those students who require a year's training in accounting as part of the preparation for courses in banking, finance, marketing, or other branches of business administration."

In logical order he treats the general uses and applications of accounting, fundamentals of bookkeeping procedure, valuation of assets and "equities" (a term he employs to designate all of the items on the "liability" side of the balance sheet), determination of profits, preparation of financial statements, and special characteristics of partnership and corporation accounting. A large amount of problem and exercise material is included, both at the end of the individual chapters, and in an extensive section at the end of the text.

The author's presentation of his material is lucid and readable, and the book should be of more value to students who wish to acquire an understanding of the fundamentals of this subject than to executives who are more interested in application of such fundamentals to their business problems.

Peck, Harvey W. TAXATION AND WELFARE. *New York: The Macmillan Company, 1925. 269 pp. $2.50.*

This book attempts an impartial and scientific survey of the problem of taxation in its financial and social aspects. The first part of the study deals with the relationship between the scope of public expenditures and taxation, while the concluding portion discusses the distribution of the tax burden. The author concludes that high taxes are justified when they promote social welfare, and that they can most equitably be collected through surtaxes. In substantiating his reasoning, the writer refers to the statements of scientific authorities on public finance.

Raymond, William G. THE PUBLIC AND ITS UTILITIES. *New York: John Wiley & Sons, Incorporated, 1925. 346 pp. $3.50.*

Professor Raymond has here revised the course of lectures on public utility problems which he has been giving to his engineering students. The treatment is elementary in

character, and does not attempt to discuss the history or the present status of public utility regulation; it rather aims to set forth, in non-technical language, the fundamental ideas which should govern in the adjustment of questions of public interest, arising in connection with the creation and operation of public utilities.

The work will be of most value to the non-professional student or to municipal officials having to do with the operation or regulation of minor public utilities.

The Appendix includes a tabular statement of operating expenses and total costs of certain water service companies, and illustrates the character of the accounts which should be kept. There is also an amortization table with instructions for its use in the determination of depreciation allowances.

Robinson, Webster. FUNDAMENTALS OF BUSINESS ORGANIZATION. *New York: McGraw-Hill Book Company, Incorporated, 1925. 230 pp. $2.50.*

The author has selected what he considers the eight fundamentals of business organization, and has devoted a separate chapter to the consideration of each. Functionalization, direction, supervision, control, and incentive are some of the fundamentals considered. The relation of the worker to his job is discussed under the heading, "The Right Man in the Right Place." Probably the most interesting chapter is that on "Definite and Stable Policies," in which the writer discusses at some length the "ideal" or "general policy" which should provide the motivating force for the establishment and growth of every successful business.

The treatment of the subject of incentives is typical of the book as a whole. After setting forth a definition and classification, the author stresses their importance to the modern business organization together with the results to be gained by their use. The principles of a sound incentive wage system are developed quite fully, as are the methods of putting such a system into practice.

The chief characteristic of the book is its marked generality. The factors and relationships considered are applicable to any organization regardless of size or type. Very little new information is contributed by the book, which for the most part correlates these already well-known principles.

Sanford, Hugh W. THE BUSINESS OF LIFE. *New York: Oxford University Press, American Branch, 1924. 2 vols. $10.*

After 25 years of active industrial life the author has presented in *The Business of Life* a very comprehensive survey and analysis of social conditions and their relation to economic theory.

The first section sets forth certain economic theories which are of particular interest in modern industrial life with an explanation which will appeal to business men. An unusually clear explanation of gold wages is made the basis of an economic structure which is quite different from that ordinarily presented. The second section is devoted to the evolution and selective purification of the human race by which an "ideal state" can be attained. The third section presents the contacts and relationship of this "ideal state" with its population on the phase of taxation, currency, labor, and communism.

While this work is too comprehensive in its scope to appeal in its entirety to many readers, it presents a businesslike explanation of a subject which is of great interest to the present industrial age. The relationship between employer and employee, the development of the standard of living and other economic questions at the base of modern social unrest are presented in a concrete way which should assist in the ultimate solution of some of the problems of the business man.

Van Strum, Kenneth S. INVESTING IN PURCHASING POWER. *New York: Barron's, 1925. 248 pp. $2.*

The varying command of money over other commodities has provoked a continual discussion from the days when kings instituted coinage debasement up to the present time. The relation of investments to purchasing power is, however, only now being generally comprehended. In 1924, the first important statistical analysis of investment values was presented by Edgar L. Smith in a series of studies entitled "Common Stocks as Long-Time Investments." The figures in this analysis primarily showed the superiority of common stocks over bonds in terms of dollars. Subsequently in an article for the *Magazine of Wall Street,* Professor Irving Fisher adjusted the figures to show the rate of return realized in terms of purchasing power.

Now, Mr. Van Strum has made a detailed statistical study of the value of bonds and common stocks in terms of purchasing power. *Investing in Purchasing Power,* originally presented last spring as a series of articles in *Barron's,* clearly portrays the significant features of the investment situation, and draws the conclusion that common stocks are a most desirable form of investment.

The survey covers periods of declining prices as well as periods of rising prices. The common stocks studied are chosen arbitrarily so that knowledge of subsequent events cannot influence the results. For a majority of the comparisons the five largest rail issues and the five largest industrials are used. Well-selected statistical methods are employed to advantage in arriving at conclusions. The 24 charts which present clearly the long-time tendencies of these issues effectively supplement the text.

In the conclusion of the book, after emphasizing the greater value of common stocks in terms of purchasing power, the author wisely stresses the fact that diversification in common stock investment is of the utmost importance if the income from the stocks is to be fully as certain over a period of years and "the principal fully as secure as an investment in very high-grade bonds."

Young, Benjamin Franklin. STATISTICS AS APPLIED IN BUSINESS. *New York: The Ronald Press Company, 1925. 639 pp. $5.*

Among the wealth of recent statistical treatises, Mr. Young's book takes a creditable place. In general, the author covers a difficult field which has been treated many times, the outstanding characteristic of his work being, however, his distinctly novel approach to the subject. A hint of his method of attack may be gleaned from the title. Unlike the extremely technical approach of Jerome in his *Statistical Method,* and the more elementary standpoint of Secrist's *An Introduction to Statistical Method* (revised), Mr. Young has applied his subject to practical things; and in so doing has not hesitated to break away from its narrow confines to branch out into allied fields. In one of the final chapters he draws the distinction between accounting and statistical records, showing wherein each supplements the other and the need for cooperative effort between the two.

The author is interested primarily in the organization of statistical control in business, rather than in the tools and technique which the statistician has at his disposal. Only the latter half of the work is confined to the technical aspects of statistical method, graphic presentation, frequency classification, averages, dispersion, and index numbers. The concrete application of these devices is emphasized more than the abstract consideration of them. The first half of the volume, on the other hand, dwells on certain principles and concepts having to do, in particular, with the collection and organization of data, which are the foundation of an effective statistical department.

As he states in his preface, the author has refrained from theorizing to any great extent. The book represents his own opinions with respect to all the phases of statistics which he discusses. It is designed to fill the needs of the executive whose knowledge of the subject is superficial, rather than to add anything noteworthy to the science of statistics.

It may be noted in passing that the author's style is most pleasing. Like the substance, the language is as non-technical as is possible in the treatment of a scientific topic.